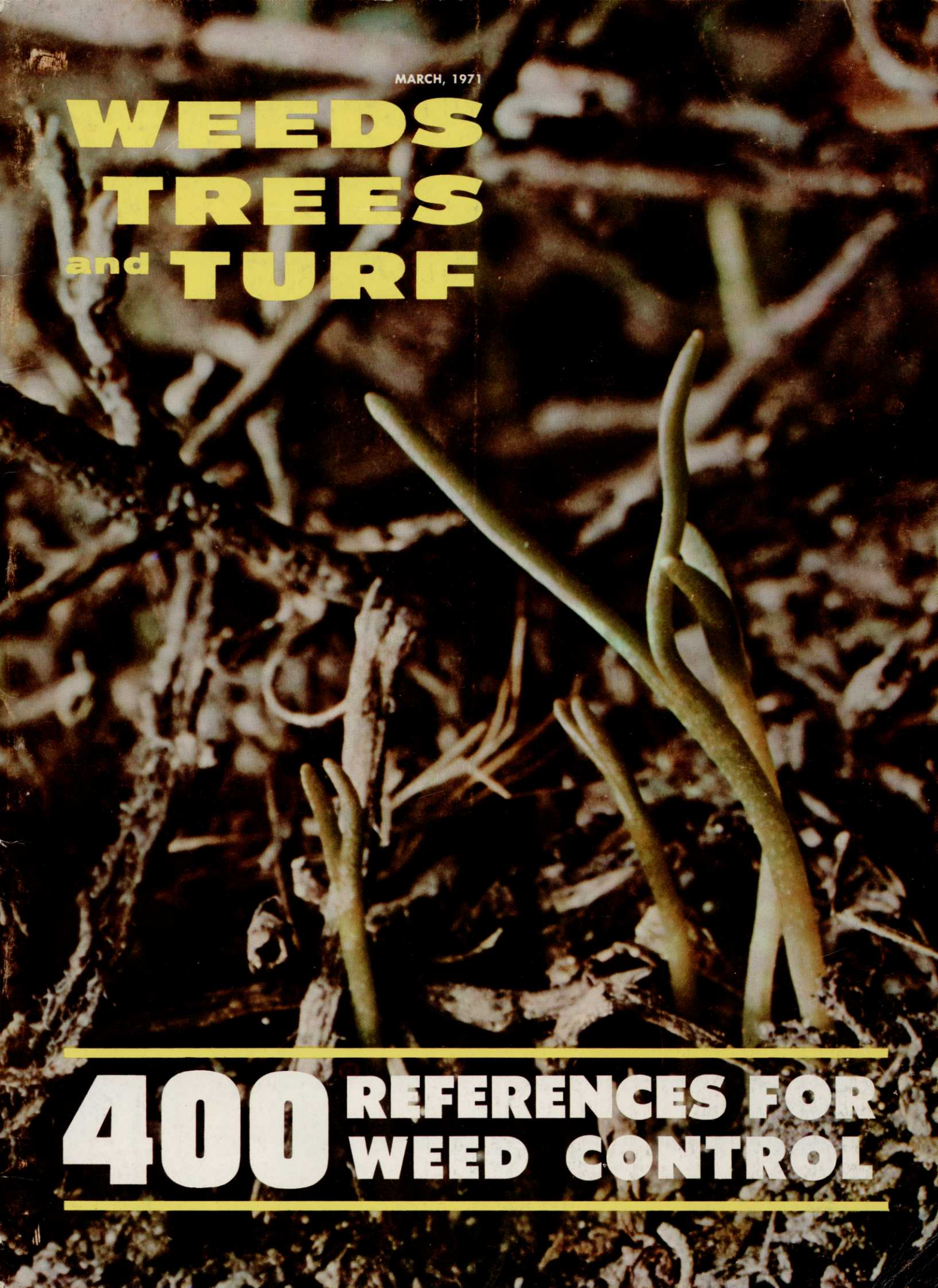
MARCH, 1971

WEEDS TREES and TURF



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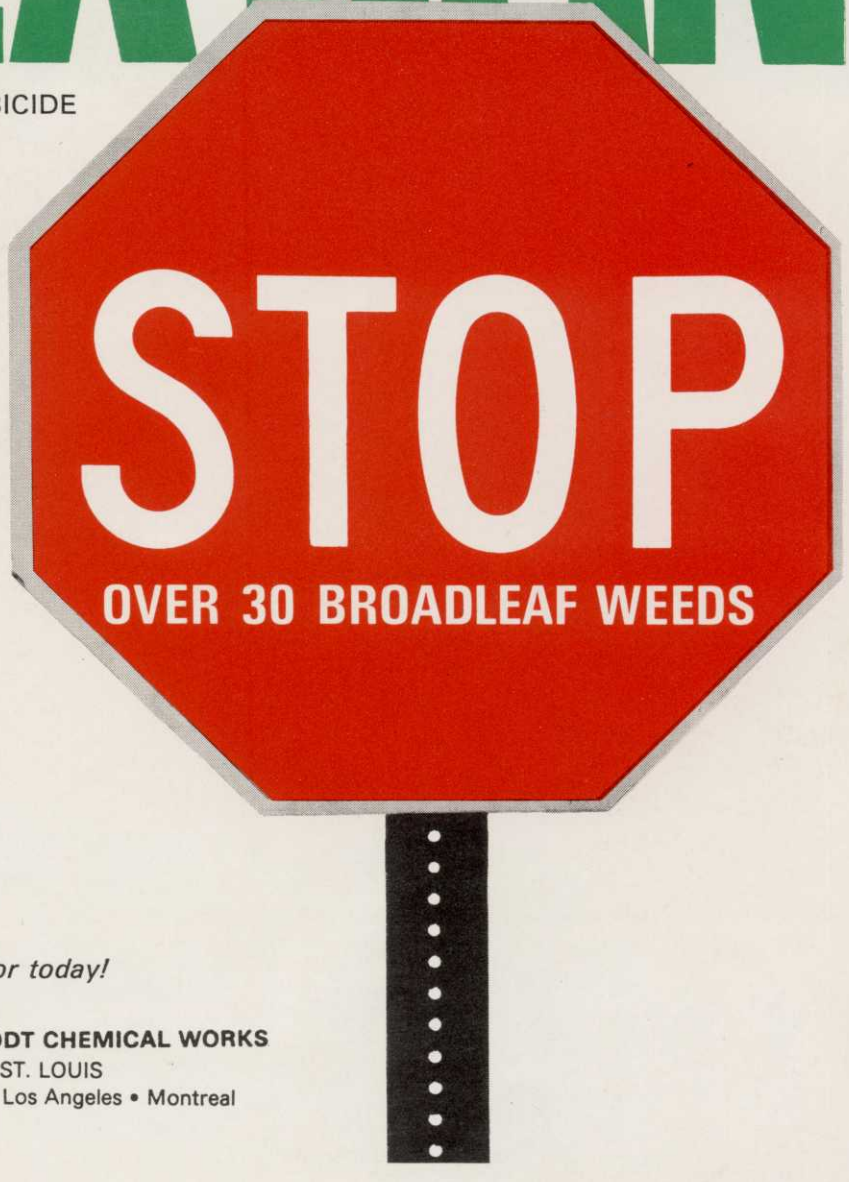

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WEEDS TREES and TURF®

Volume 10, No. 3 March, 1971

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Special for This Issue

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The Cover

You may need to get down on your knees to discover this pesky annual dicot weed that reproduces profusely by seed. Perhaps Dick Bangs at O. M. Scott & Sons, Marysville, Ohio, did to take this picture. This is knotweed and it grows in compacted soils, such as athletic fields and playgrounds, throughout the northern U.S. and to a lesser extent in southern states. It germinates early, often in March, and resembles new seedling grass for a while. Upon maturing, it becomes a prostrate-growing weed and grows in all directions from a small taproot. Forming a dense mat, it smothers out desirable turfgrasses. "The Grass People" say herbicide formulations of dicamba will now control this serious weed pest, at rates of only ¼ lb/acre of active ingredient.

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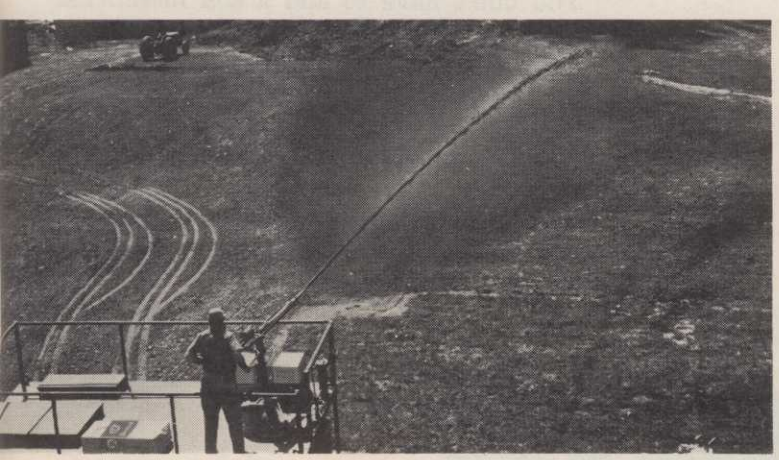
Turf Establishment Hints

Conwed® Products Challenge The Elements



Establish turf over broad areas quickly with Conwed® HYDRO MULCH. Forms a tough continuous mat that resists erosion, absorbs and retains moisture for fast germination.

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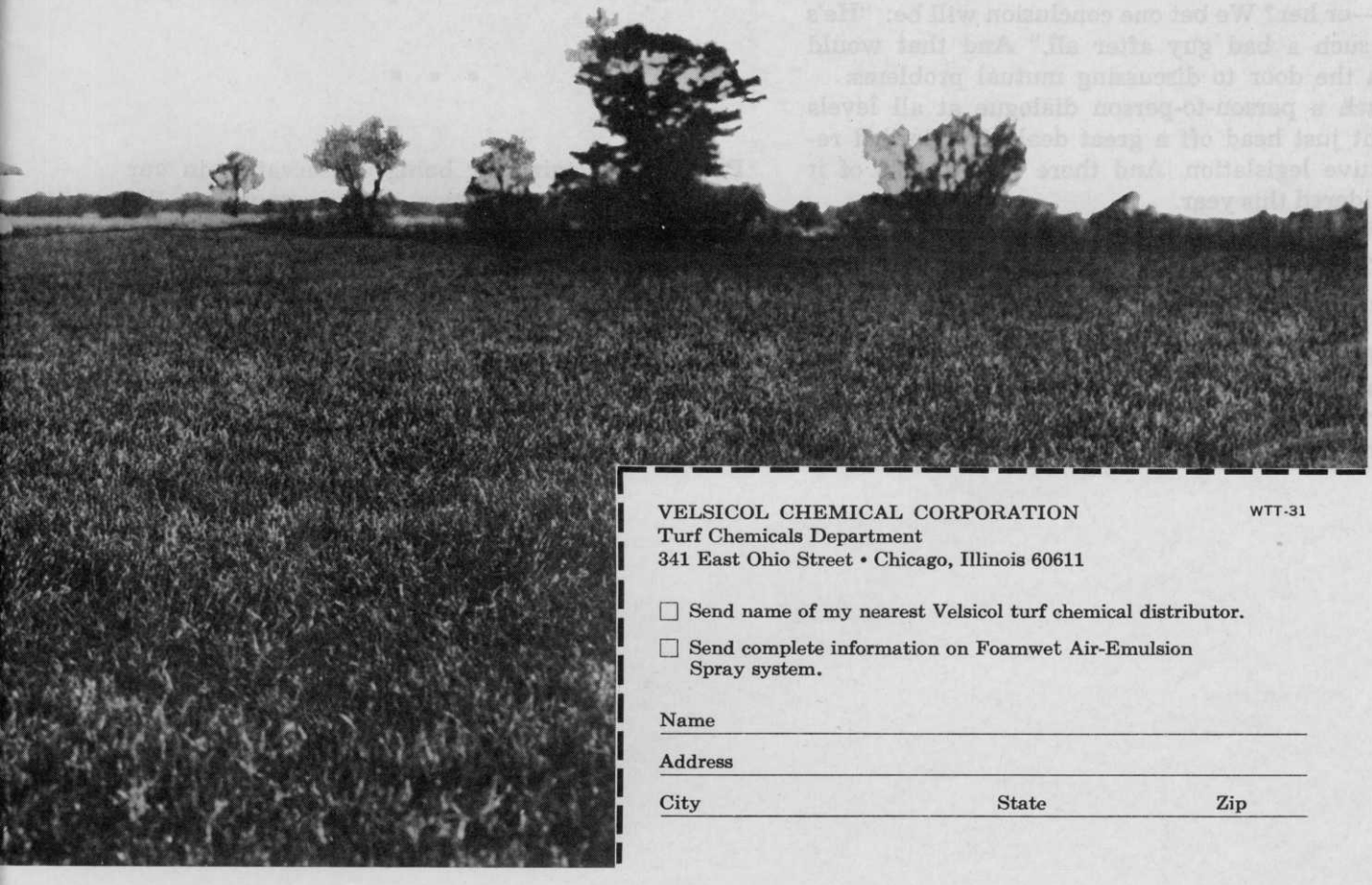

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Pesticides and the People-to-People Approach

WHEN EVERYTHING ELSE FAILS, try the personal approach. We believe it is time for pesticide industry professionals to sit down beside the ecologists and pollution fighters to discuss improvement of the world we live in. The least, but a most important, result would have to be the discovery that all parties were sitting on the same side of the environmental fence.

Face it . . . there is a considerable communication gap between such groups as the chemical industry and conservationists and naturalists of all degrees. And all of the scientific data hurled both ways via the airways, the printed media, and the conference rostrum occasionally as close as across town has not narrowed the gap.

The pesticide industry still wears, if not black, a shady hat in the minds of members in organizations such as the National Audubon Society.

Who is the person in your town who is anti-pesticide? How about a face-to-face chat with him—or her? We bet one conclusion will be: "He's not such a bad guy after all." And that would open the door to discussing mutual problems.

Such a person-to-person dialogue at all levels might just head off a great deal of unneeded restrictive legislation. And there will be lots of it considered this year.

"While I believe there was a need for some restrictions, I personally think DDT is perfectly safe," said an official who had been in the Food and Drug Administration, but is now a part of the Environmental Protection Agency. "But people got scared," he added, and government is obligated to do something.

And another federal administrator who's now a part of EPA confessed that until he was invited to speak he had never heard of an organization such as the Weed Science Society of America. But he quickly added that he was ready to get acquainted. "Come in and see us; tell us your problems and your needs," he challenged.

So next to getting to know the person who appears to be against your business interests, you should make acquaintance with the "mediator" of your differences.

To continue our role of providing what hopefully is useful information, we're carrying an article in this issue (Page 16) that gives the basic organization of EPA and the direction that EPA Administrator William Ruckelshaus hopes to go. The article includes a listing of the 10 interim regional coordinators with complete addresses and telephone numbers. The rest is up to you. Isn't it worth trying a people-to-people approach to settling this environmental question—out of court?

* * *

P.S. We apologize for being conservative in our estimate of your reaction to this magazine. We announced a special feature for March—an index to sources of information on weed control. We had no idea how many there were. One hundred sounded like a nice round number. Phew! Response from industry, government, university, and our own files turned up close to 400! And we're sure we've missed a bunch. Sorry about that; we shall try listing them next time.

Gene Ingalsbe

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Parkmaster 9†

This new TORO cuts up to 90 acres a day. It has 35% more mowing capacity than our Parkmaster 7† or any comparable machine. But capacity isn't the whole story on this versatile, labor-saving rig.

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We think this adds up to a lot of mowing. So if you have a lot of turf to take care of, get in touch with us.

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the national GREENSCAPE

NEW PESTICIDE BILLS were introduced in both houses of Congress Feb. 10. They are H.R. 4152 and S.745. The Senate Bill is essentially an updating of previous acts to underline the responsibilities of the Administrator of the Environmental Protection Agency. There are some new provisions, however. The EPA administrator has the power to classify usage of a pesticide, upon registration. He may designate it for "general use," for "restricted use only," or for "use by permit only." The restricted use classification is defined to cover any material that "if used without restriction could cause injury to the applicator, or when care is needed in its application to protect the environment." Restricted pesticides could be used "only by or under the direct supervision of approved pesticide applicators." Permit-only pesticides could be used by anyone "who has a license issued by the state in which such operations are conducted, upon the basis of a demonstration of his competence in the use and other handling and knowledge of the toxicity and antidotes of the pesticides involved, according to standards approved or prescribed by the Administrator." Pesticides in this category will be made available only with approval, in writing, for the amount and type of article for each particular application, of an approved pest management consultant (presumably a designated state or area federal official). The EPA administrator also has the power to change the classification of a pesticide by 30-days' prior notice in the Federal Register. The bill does not bar states from enacting more restrictive regulations.

URBAN TRAVEL CAN BE EXPECTED TO INCREASE 75% by 1990, predicts F. C. Turner, Federal Highway Administrator, given a 50% increase in urban population. Heavy additional demands for highway transportation will develop—and be met with increasing efficiency and minimal crises . . . if. Addressing the 50th meeting of the Highway Research Board, he contended that long-range highway planning had been reasonably accurate, except for private development that followed. "The public expects us to plan highways properly, but it refuses to work with us by advising us of its plans," he charged, citing as examples a sports arena, shopping center, or hotel-motel complex that is built after the highway is finished. He asked for and foresees a public agency that would coordinate and integrate the total land development as a part of highway planning. Turner sees no great change in the physical appearance of highways nor in the vehicles that travel them by 1990. The big change will be in how highways are planned, "with increased attention given to social and environmental factors."

A "FANTASTIC FUTURE" is predicted for the nursery industry by Robert F. Lederer, executive vice-president of the American Association of Nurserymen. But it may not be realized by those who continue to "do business in the same old way because 'this is the way we have always done it'." New corporations are entering the industry with new concepts, he told the Allied Horticultural Trades Congress. "They see the tremendous future and are either going to

"My championship flight for all golf course maintenance," says Vance R. Price, superintendent of Tanglewood Park, Clemmons, North Carolina, "are these Dolge winners. Any course is easier to keep up to par at less cost with Dolge products. They have my heartiest recommendation for every golf course maintenance need."

Dolge Stroke-Savers

1. TOTE Weed Eradicator. Total kill, plus maximum safety. Acts positively on annuals, biennials, perennials; sterilizes soil. Exceptionally high LD rating. One gallon of TOTE in 15 gallons water treats 1000 sq. ft. at 83.3% labor saving.

2. E.W.T. 2,4-D Selective weed killer kills all broadleaf weeds—dandelions, plantain, poison ivy. Spares good grass.

3. PENETRATE. Organic soil improver opens dense soils, improves porosity, encourages deep stronger root growth. Not a wetting agent.

4. DOLGE LAKE DYE. Turns muddy water hazards and ponds bright, lasting blue. No danger to pets or wildlife.

Plus BOOST J70 miracle solvent cleaner for all machinery and golf carts.

CRABGRAX (AMA/DSMA), for positive crab grass control, even hard to kill silver crab grass. Full line of Turf Insecticides to control animal and insect pests. DOLCO *Pine Ball Wash*, pleasantly piney, quick thorough cleaning of golf balls in paddle or rotary machines.

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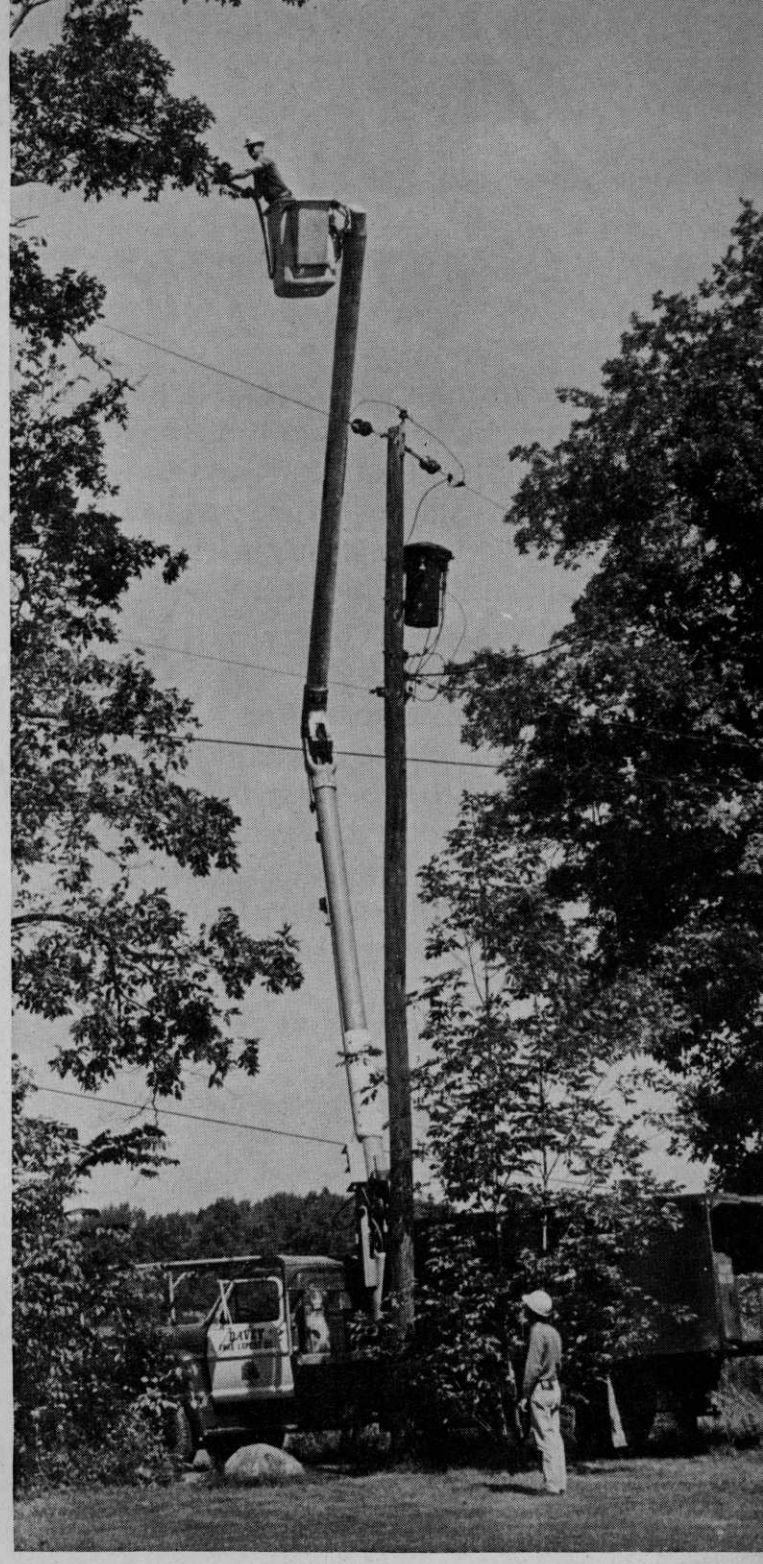
share it or take it over. Citing a recent survey indicating people would most like to spend their "discretionary income" on home improvement, Lederer interpreted this desire in terms of nursery stock sales. "The nursery industry is getting only $2 billion of the $17 billion a year earmarked for home improvement. A great deal more is available if we only learn to speak up for our share."

REVEGETATION TECHNIQUES now under study may make possible the reclamation of 250,000 acres of strip mining spoil banks in Virginia and West Virginia and similarly devastated areas throughout the nation, says USDA. Two methods are being explored: (1) using plants that can tolerate the toxicity present from excess amounts of minerals and soil acidity; and (2) neutralizing the acidity of the soil through fertility management. In the first year, best results with plants after soil fertility treatments came from weeping lovegrass and tufcote bermudagrass. Mulch is extremely important, researchers found, to prevent loss of moisture and formation of a hard crust that is nearly impossible for young seedlings to break through.

A CASE OF MISTAKEN IDENTITY may be causing undue concern regarding pesticide residues, according to an article by three Wisconsin soil scientists in a recent issue of Pesticides Monitoring Journal. The trio, B. E. Frazier, G. Chesters, and G. B. Lee, found "apparent" residues of chlorinated hydrocarbon pesticides in soil sealed since 1909-1911, some 35 years before chlorinated hydrocarbons were discovered. Though the gas chromatograph can detect to parts per billion, the device cannot necessarily distinguish pesticides from compounds in nature each and every time. Confirmatory testing should follow before statements are released, the scientists advised.

ELEGANT TOOLS BUT POOR CRAFTSMEN . . . that's how an industry researcher describes "a weak link" in the safe use of pesticides. Dr. Julius E. Johnson, vice-president and director of research and development for Dow Chemical Co., has called for more training of pesticide applicators. Though not wishing to discredit "those competent professionals who do a good job," he urged training in agricultural schools leading to the granting of professional licenses. Two categories should then be used to classify agricultural chemicals: those for licensed professionals only and those for non-professionals.

HORTICULTURAL RESEARCH INSTITUTE wants to research the theory that man is genetically programmed to "warm, humid air, green growing plants, and the presence of warm-blooded animals." The project has been okayed, but delayed, because of the lack of a particular kind of green stuff—money.



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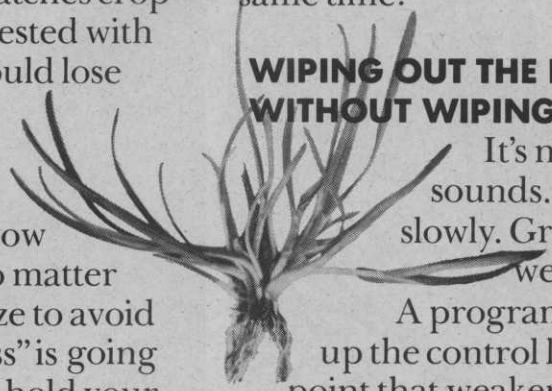
How to remove the without removing

Every summer you've tried to hold your Poa annua. But suddenly it's unusually hot and humid and your fairways and greens start to wilt. Big brown patches crop up. You find your Poa annua infested with disease. You're in trouble. You could lose your fairways and greens.

Don't say it can't happen to you. It can. Because no matter how careful you are, no matter how much you water to avoid wilt, no matter how often and lightly you fertilize to avoid stress, one day your "failure grass" is going to fail. So why gamble and try to hold your Poa annua? Why not get rid of it before it fails?

How do you do it? How do you keep the course beautiful, the players playing, the Poa annua on the way out, and the desirable grasses on the way in, all at the same time?



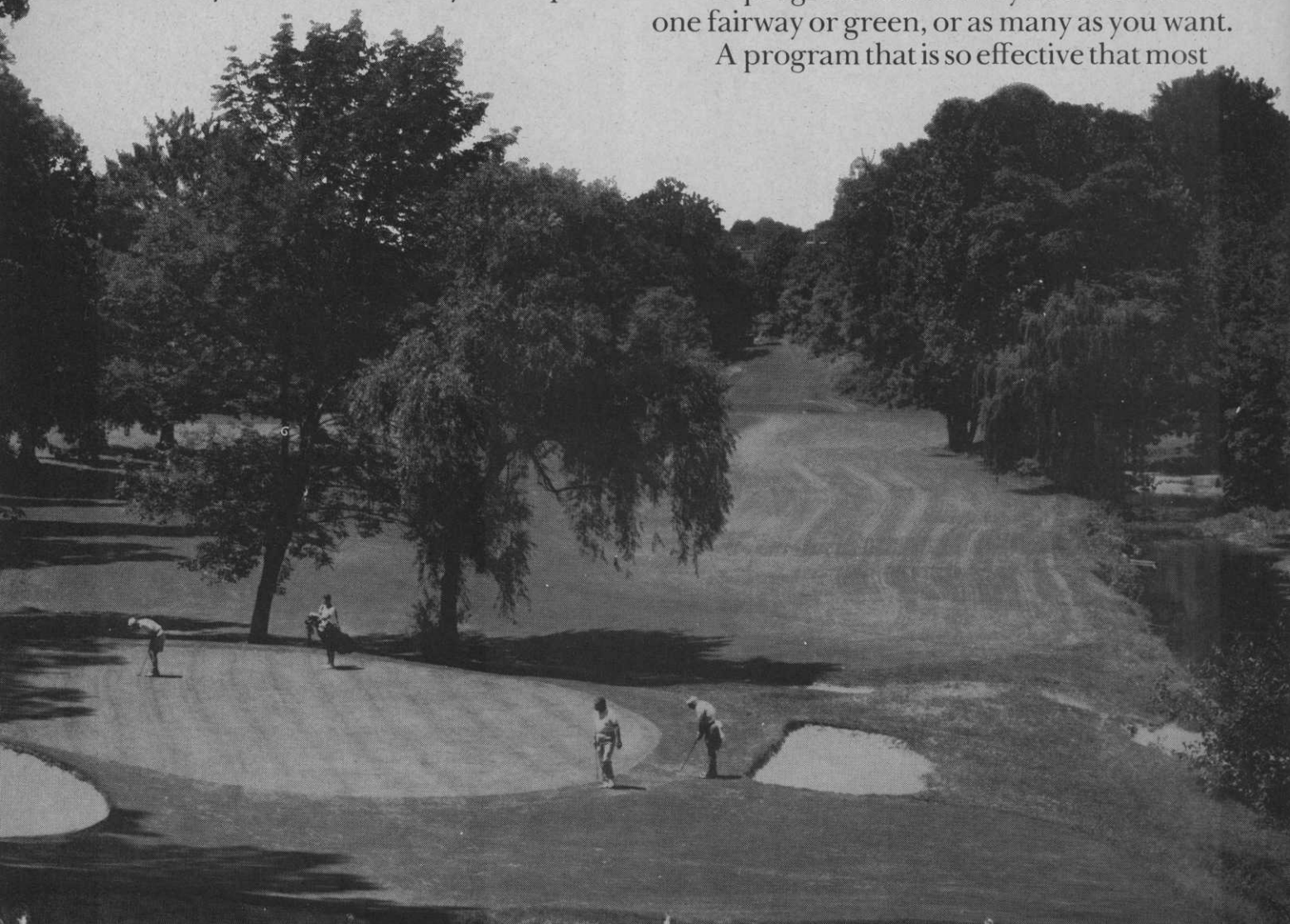
WIPING OUT THE POA ANNUA WITHOUT WIPING OUT THE COURSE

It's not as difficult as it sounds. Not if you do the job slowly. Gradually. With a simple, well thought out program.

A program that precisely builds up the control level in your soil to a point that weakens the Poa annua and allows the desirable bent and bluegrass to fill in.

A program that allows you to start with one fairway or green, or as many as you want.

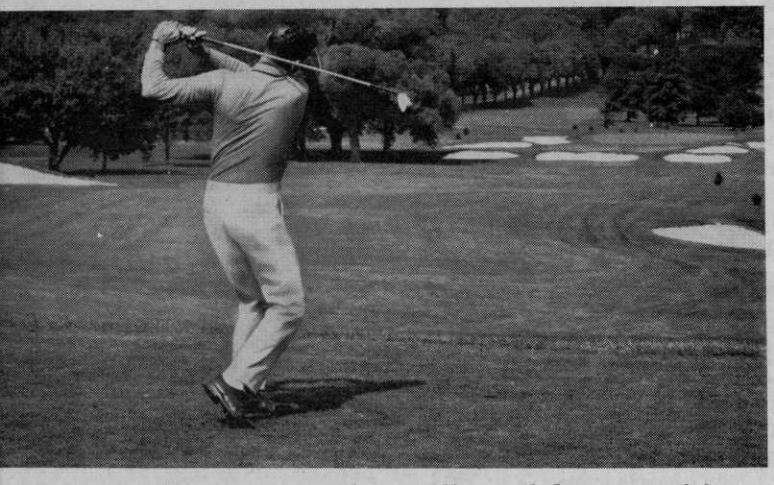
A program that is so effective that most



Poa annua the golfers

of your players won't even know that the course is being treated.

A program that even improves play by inhibiting the uneven, unsightly Poa annua seed heads.



A program that will work because it's already worked on many other courses.

A program that, in the final analysis, doesn't have to cost you an arm and a leg.

A SUCCESSFUL TESTED PROGRAM FOR THE GRADUAL REMOVAL OF POA ANNUA

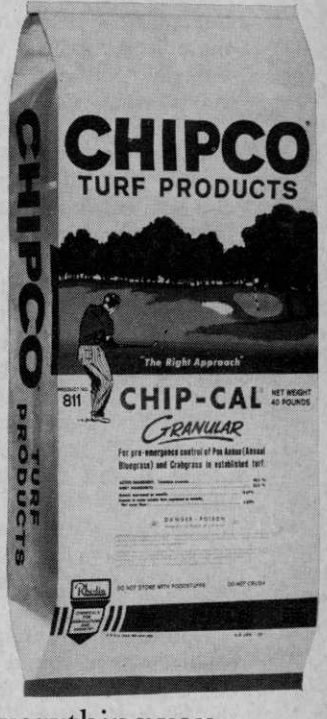
This tested 6-point program is successfully eliminating the Poa annua at Greenbrier, National Cash Register Country Club and hundreds of other courses. It can do the same for you.

1. Drain low areas: Improve drainage of fairways with trenching and vertical slitting.
2. Correct soil acidity: Apply lime to greens or fairways if under a pH of 6.
3. Aerate, thatch or spike the grounds and eliminate phosphorous in your fertilizer program. Make room for new growth. Bring up some soil, get seed against soil. Overseed often.
4. Apply from 4 to 6 pounds of Chip-Cal Granular per 1,000 square feet on fairways, or 2 to 4 pounds on greens. Apply in the spring and fall. Vary application rates according to the percentage of Poa annua, available phosphate, pH and soil type.
5. Achieve Poa annua control: Light sandy soils low in phosphorus require less Chip-Cal to reach control.
6. Maintain control: Use 2 to 4 pounds of Chip-Cal per 1,000 square feet, either in the spring or fall. If Poa annua is dying too fast, use a liquid phosphate as a check valve.

Note: Chip-Cal Granular has been specially formulated for your Poa annua restriction program. It's granulated on a vermiculite base. Which helps give you a more uniform application and a more gradual release when you're building up your soil's control level. Chip-Cal also prevents crabgrass, goose grass, and controls soil insects and chickweed.

14 OTHER CHIPCO TURF PRODUCTS THAT TAKE CARE OF EVERYTHING FROM KNOTWEED TO SNOW MOLD

In addition to Chip-Cal Granular to control Poa annua, we have the most complete line of products to help you with your other turf problems.



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EPA

A Capsule Look At a Newborn Giant Already Running

By GENE INGALSBE

WHAT IS the Environmental Protection Agency? The most frequent answer from observers in the chemical industry has been: "We shall have to wait and see."

The inference is that ERA has yet to project its "image" with regard to pesticides; that EPA will be *how it acts* and on *what basis* it acts. So far, not enough experience has been gained from working with the new agency to characterize it more specifically.

"Registration activity is just about at a standstill until we get some guidelines on whether research data required or registration procedure has changed," said one industry spokesman.

In the words of the President who created EPA on Dec. 2, 1970, one thing is "perfectly clear"—EPA has the power to act.

When the public furor over pollution of all sorts seemed to endanger the contents of the ballot box, some intense political soul searching about what to do began. Outcries against pollution weren't new. Nor had government turned a deaf ear in the past to people who wanted cleaner, air, water and landscape. In fact, government had been extremely responsive, assigning responsibility for a portion of the environment to some 80 different federal agencies. What hadn't been decided was where the buck stops. It now appears the buck stops at EPA.

What has been shaking the rafters is that EPA not only has the power to act, it also has begun to exercise that power within 60 days of its formation! Few new government agencies have been able, or demonstrated a willingness, to function so quickly.

Dozens of municipalities and industries have found themselves under legal pressure to stop polluting the air and water. The Federal Refuse Act passed in 1899 has been dusted off and fitted with teeth. Permits are to be required for dumping wastes into rivers and lakes. The Department of Army, charged with carrying out the program, already has written and published lengthy procedural instructions. A reorganization of air quality districts is under way. Ten regional EPA offices have been formed and interim coordinators announced.

Right or wrong, the decision on DDT demonstrates how quickly EPA can act. Within a few days after a U.S. Court of Appeals "ordered the federal government" to cancel remaining uses of DDT, the EPA notice went out on the cancellation and on a 60-day review to determine whether DDT and certain uses of 2,4,5-T should be suspended.

Clearly, persons who want to change the environment now know where to go. The buck stops at EPA.

'Political-Mix' in Decisions

During a visit to EPA offices, concern was expressed on the part of industry on how such power might be exercised. If you mean to ask whether we are going to be "swayed by activist groups," answered an EPA spokesman, I can assure you that decisions will be based upon reasonable assessment of the facts. "But you have to expect a certain political-mix with each decision," he added.

How strong the political-mix will be remains to be seen.

Additional verbal reassurance comes from EPA administrator William D. Ruckelshaus, who has said: "The alarm has been sounded. Now we must begin to act. This places a new responsibility on all of us. All of us must begin to distinguish between those corrective environmental actions which are helpful and those blind over-reactions which are harmful."

Ruckelshaus Has Aggressive Record

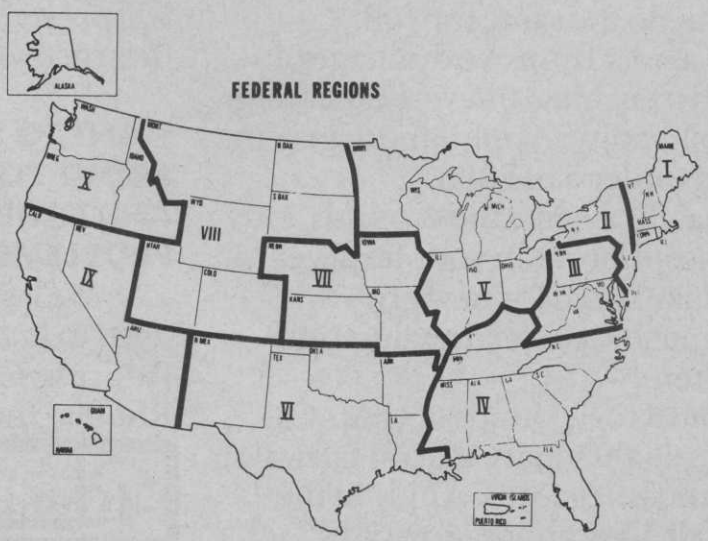
Beyond emphasizing that EPA will carefully evaluate the benefit-risk equation to every alleged pollutant, he talks tough. There is no indication he'll use benefit-risk as a loophole to treading softly.

We've let technology run unchecked "in a 300-year war against nature," he charged. With no more frontiers and the spoils of that war upon us, a new "environmental ethic is needed," he stated.

"There is no excuse for the delay and dalliance which have brought us to our current crisis," he asserted, calling for every member of society to participate.

"I am going to insist, with the authority I have, and with all the powers of persuasion at my command, that all existing means of controlling pollution be applied, across the board, in every city and town and on every industry in this country—starting right now."

Ruckelshaus, 38, an Indiana Hoosier and a Harvard-educated lawyer, served five years as deputy attorney general for Indiana, his duties including legal assistance to health and pollution agencies. He



REGIONAL COORDINATORS

Region I
Lester Klashman
Room 2303
John F. Kennedy Fed. Bldg.
Boston, Mass. 02203
617/223-7210

Region II
Gerald M. Hansler
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215/597-4506

Region IV
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Suite 300
1421 Peachtree St. N.E.
Atlanta, Ga. 30309
404/526-5727

Region V
Francis T. Mayo
33 East Congress Parkway
Chicago, Ill. 60605
312/353-5250

Environmental Protection Agency

initiated numerous state legal actions against polluters and drafted the Indiana Air Pollution Control Act.

He served two years in the Indiana House of Representatives, becoming the first legislator in Indiana political history to become majority leader in his first term.

Ruckelshaus was defeated in his bid for the U.S. Senate in 1968, but the following year was appointed assistant attorney general of the U.S. Civil Division. In this capacity, he was in charge of a division which oversaw 200 lawyers and who carried a caseload in excess of 19,000 cases at the time he was named EPA administrator last November.

Johnson's Career Is Fisheries Research

Perhaps of more direct interest to the pesticide industry is the man who is the acting commissioner of the Pesticide Office, Dr. Raymond E. Johnson.

A half-dozen pesticide industry officials queried about their impression of Johnson rate him "as a responsible administrator." None expressed an unfavorable opinion.

Johnson earned a doctorate in fisheries work from the University of Michigan in 1942. After six years as supervisor of fisheries research for the Minnesota Department of Conservation, he entered federal service in the Bureau of Sport Fisheries and Wildlife, U.S. Department of Interior, where he served until his EPA appointment. Since 1965, he had been assistant director for research in the fisheries and wildlife bureau. In 1968, he received the Interior Department's Distinguished Service Award "in recognition of eminent service in the conservation of natural resources."

EPA Born a Giant

EPA has made a fast start as a new agency primarily because it was not formed from the ground up, man by man. Instead, it is a collection of functioning agencies and departments. For example, the entire pesticides registration division from USDA moved to EPA.

These operating groups brought their budgets with them, giving EPA a $1.4 billion budget this fiscal year. When fully staffed, EPA is estimated to have 6,000 employees. At formation, a building couldn't be found big enough to house the entire family.

Here is a capsule of what major administrations went to EPA and from whence they came:

From the Department of Interior —The Federal Water Quality Administration, functions provided by the Federal Water Pollution Control Act, and the Water Pollution Control Advisory Board functions relating to studies on the effects of insecticides, herbicides, fungicides, and pesticides upon fish and wildlife resources administered by the Gulf Breeze Biological Laboratory of the Bureau of Commercial Fisheries at Gulf Breeze, Fla.

From the Department of Health, Education and Welfare—Then National Air Pollution Control Administration, including the Air Quality Advisory Board, the Environmental Control Administration's bureaus of Solid Waste Management, Water Hygiene, and Radiological Health, functions of establishing tolerances for pesticide chemicals under the Federal Food, Drug, and Cosmetic Act.

From the Atomic Energy Commission — Functions administered through its Division of Radiation Protection Standards.

All functions of the Federal Radiation Council.

From the Department of Agriculture—Functions under the Federal, Insecticide, Fungicide and Rodenticide Act; functions under section 408 (1) of the Federal Food, Drug, and Cosmetic Act; and functions administered through the Environmental Quality Branch of the Plant Protection Division of the Agricultural Research Service.

Table 1 gives a skeleton organization chart for EPA and Table 2 outlines the 10 regional territories, coordinators and addresses.

Functions of the Pesticide Office

EPA's Pesticide Office is charged with these responsibilities:

"The office shall be responsible for the pesticides activities of the Agency, including establishment of tolerance levels for pesticides residues which occur in or on food and the registration of pesticides uses for protection of human safety; monitoring of pesticides residue levels in foods and portions of the environment; review of pesticide formulations for efficacy and hazard; regulation of sale or use patterns when necessary; checking for compliance with label provisions, research on effects on human health, non-target fish and wildlife and their environments; and establishment of guidelines and standards for analytical methods of residue detection."

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Kansas City, Mo. 64106
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Region X
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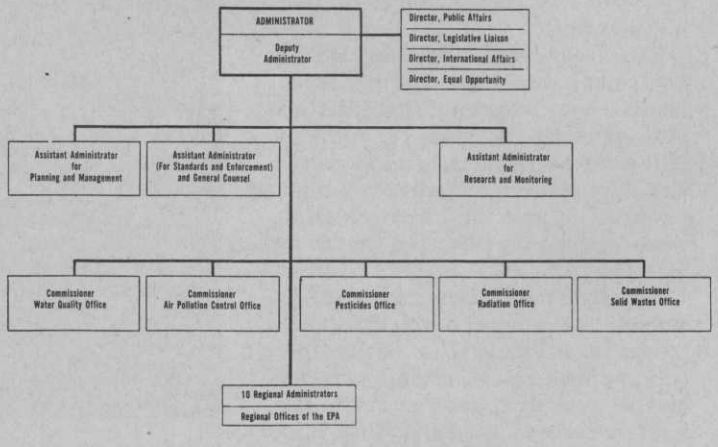
Room 501, Pittock Block
921 S.W. Washington St.
Portland, Ore. 97205
503/226-3914

ORGANIZATION CHART



Wisconsin Trials Indicate

BEST HERBICIDES FOR TREE PLANTING

By GORDON R. CUNNINGHAM and GAVIN G. WEIS*

The establishment of new forest plantings by use of herbicides was started at the Hancock Experimental Farm in 1969. The objective of this trial is to determine the tolerance of two major Wisconsin Christmas tree species, white spruce and scotch pine transplants, to various herbicides on light sandy soils. Soils of this area are mapped at Plainfield sand, and are droughty under normal conditions.

Treatments were sprayed on an old alfalfa-brome sod and replicated three times. Predominant grass species were quack, brome and green foxtail. The major broadleaf weed was alfalfa with some redroot pigweed, hoary alyssum and white cockle.

Wettable powders and emulsifiable concentrates were applied with a bicycle plot sprayer having a 5 ft. swath. Granular materials were applied in a 3 ft. band with an applicator designed by Agricultural Engineers at the University of Wisconsin.

Simazine wettable powder and granules, atrazine wettable powder and dichlobenil (Casoron) granules were applied at 2, 4 and 8 lbs. (actual) per acre. Simazine WP at 2, 4 and 8 lbs. per acre was applied in combination with aminotriazole at 4 lbs. per acre and with paraquat-dichloride (Paraquat at 1 lb. per acre. The treatments were initiated the fall before planting, and again the following spring before or during planting.

Fall treatments were applied on September 11, 1969. Spring treatments were applied immediately after plowing on April 17, with the following exceptions: aminotriazole and Paraquat were applied pre-plant on April 8; and the same materials were applied by directed spray on May 29.

Results show, after one growing season, for single herbicide treatments, atrazine 80W at 4 lbs. per acre, applied fall or spring, was one of the most effective* and was the least expensive in controlling both grasses and broadleaved weeds. Germination and growth of green foxtail in late summer was extensive. However, it did not appear to affect survival of the trees. Fall-applied Simazine WP and granules controlled grassy weeds effectively at 4 lbs. per acre, but was ineffective against broadleaved weeds. Simazine WP at 8 lbs. substantially increased the effectiveness of broadleaf weed control.

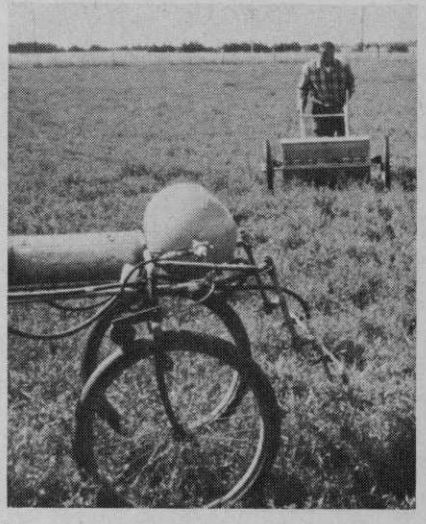
The ineffectiveness of dichlobenil was due probably to the fact that it was not incorporated into the soil at time of application. Vaporization from spring-applied dichlobenil granules may have resulted in lower tree survival.

Excellent weed control and survival of trees* were obtained with aminotriazole at 4 lbs. per acre applied in the fall, followed by 8 lbs. of Simazine WP applied at planting. Applying these same materials together in the fall, but decreasing the Simazine WP to 4 lbs. per acre, gave adequate weed control and tree survival.

This herbicide trial will be continued for at least two more growing seasons to observe effectiveness for continued weed control and for phytotoxicity to the trees.

* 90% or more

* Cunningham is Extension Forester at the University of Wisconsin; Weis is superintendent of the Hancock Experiment Farm.



These are the spray rigs the Hancock Experimental Farm used in its herbicide trials on new forest plantings.

A Princep foundation gets most weeds before they become weeds.

It's a more attractive way to keep bare ground bare. Using Princep® herbicide to kill weeds before they come up. That way you don't have a lot of ugly dead weeds hanging around as you do with contact weed killers.

Not that Princep eliminates the use of contacts entirely. You may need them to get the few weeds Princep misses. But starting with Princep as the foundation for your herbicide program you can solve the bulk of your weed problems. More economically and safely than anything else.

In fact, just about the only thing in any danger from Princep are weeds. It's safe to use. There's minimal leaching and no contact action, so it's safe to nearby crops and ornamentals.

So if your object is bare ground weed control, use the safe heribicide. And the best foundation herbicide. Princep.

For information about Princep, brand of simazine, and other Geigy herbicides, AAtrex®, Pramitol®, and Atratol®, write to Geigy Agricultural Chemicals, Division of CIBA-GEIGY Corporation, Ardsley, New York 10502.

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On Turf, Shrubs, Vines and Trees . . .

MAINTAIN SUCCESS BOOSTING

EDITOR'S NOTE: Interest has been rising almost in direct proportion to the favorable research and experience with growth retardants—and that's a pretty exciting statement! One such product, MAINTAIN, caused a great deal of comment at two recent conferences, the Southern Weed Conference and the North Central Weed Control Conference. U. S. Borax representatives reported research on different formulations of MAINTAIN for use on turf, broadleaf weeds, ornamentals and trees. Because of the interest, we're publishing the complete paper.

By GORDON K. HARRIS,
G. BURKE GARRETTE, and
DAVID O. ANDERSON
U. S. Borax & Chemical Corporation
Los Angeles, Calif.

GREENHOUSE and preliminary field testing of chlorflurenol, a new growth retardant, (methyl 2-chloro - 9 - hydroxyfluorene - 9 - carboxylate) was begun by U. S. Borax Research Corporation in 1966. Discovered by E. Merck of Darmstadt, West Germany, the product is now known by the trade name MAINTAIN CF 125.

Research plots were established in 1968 to determine dates and rates best suited for various grass species in the major soil and climatic zones in the United States and Canada. From these tests it was established that the optimum combination rate of one lb/A of MAINTAIN CF 125 plus 3 lbs/A of MAINTAIN 3 (maleic hydrazide) was the most promising.

USDA registration has been obtained for use on turf and associated broadleaved weeds for MAINTAIN CF 125 and MAINTAIN 3.

MAINTAIN CF 125 applied as a foliar spray has proved to be an effective method of retarding the growth of a broad spectrum of woody plants at very low rates. MAINTAIN CF 125 is absorbed and translocated rapidly to the terminal growing points where it interferes with the growth process. Foliage of a treated woody plant is usually darker green in color and remains retarded from two months to a full growing season.

MAINTAIN A is a formulation of chlorflurenol used with an asphalt emulsion as a tree wound dressing. It effectively inhibits growth of sprouts from the exposed cambium, and reduces the number and length of sprouts developing as a result of the pruning cut.

MAINTAIN S, a formulation of chlorflurenol in a solvent system, effectively penetrates the bark of woody plants and moves rapidly to the terminal growing points and inhibits new growth.

In 1968, MAINTAIN CF 125 and MAINTAIN 3 were used at several rates and dates, alone and in combination, throughout the United States and Canada in four major regions — the Northwestern, North Central, Northeastern and Southern. Plots were 100 sq. ft., with either a three or five-foot control strip adjacent to each side of the plot to provide maximum accuracy in plot evaluations. Seventeen grass species were tested and some 35 broadleaved weed species, which were associated with the grasses, were tested.

In 1969, emphasis was placed on test plots of one acre or more which were applied with field-scale equipment available to the cooperator.

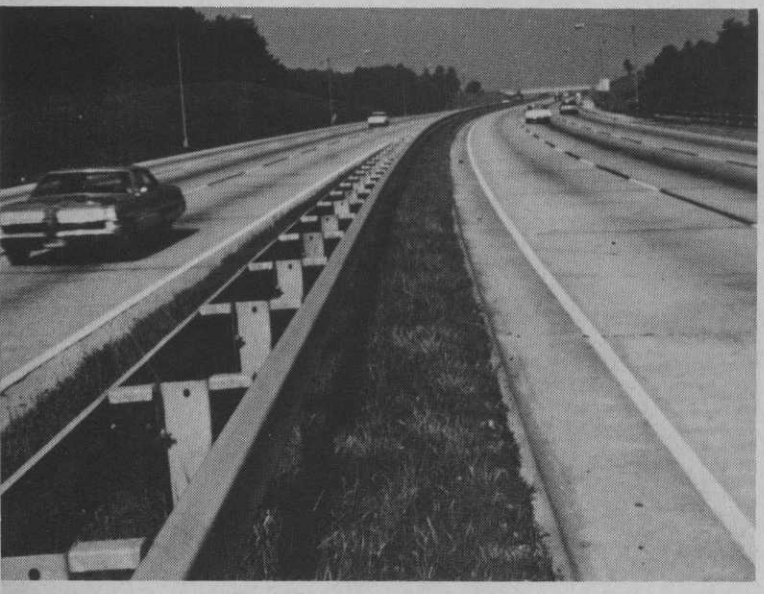
In 1970, the emphasis was geared to expanding field use and experiences.

Use of MAINTAIN CF 125 in combination with MAINTAIN 3 has been found to be economically effective in retarding grasses. Optimum retardation is obtained when treatments are made after spring mowing.

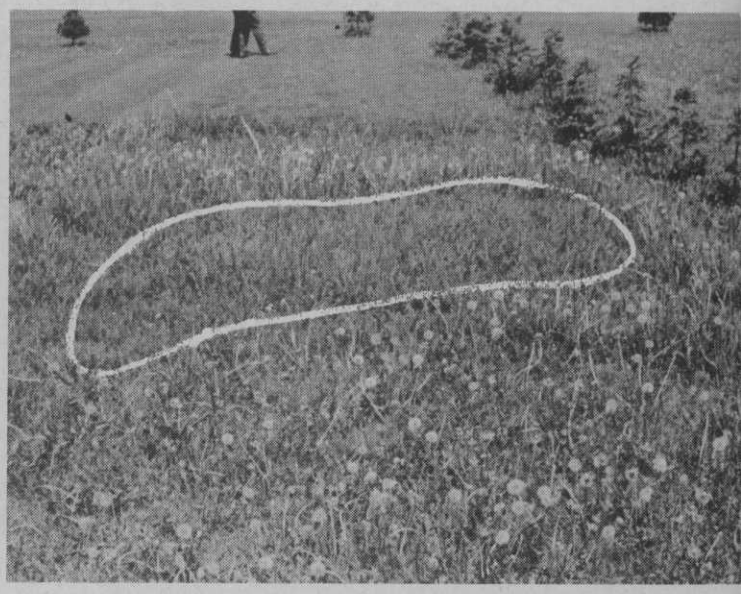
The MAINTAIN combination treatment does the following:

1. Interferes with the development of early growth stages of grasses, keeping the vegetative growth short and inhibiting the development of seed heads.

2. The active material translocates to the growing points of grass and



This median on a highway near Atlanta, Ga., was treated with 2 lbs./acre of MAINTAIN CF 125. In saving several mowings, it meant increased safety for workmen and traffic.



MAINTAIN 3 and CF 125 demonstrated excellent dandelion control at 1 gal. of each per acre at Rosemere in Quebec, Canada. Plots were treated in September and evaluated in July.

GROWTH RETARDANTS

primarily retards the top growth, thus leaving the root system vigorous for a healthy turf.

3. It keeps turf greener for an extended period of time.

4. It controls unwanted annual grasses and broadleaved weeds in the turf, thus improving the turf appearance and making moisture and nutrients available to the turf which would otherwise be utilized by undesirable weeds.

5. It gives consistent season-long control of a broad spectrum of broadleaved weeds, such as dandelion, dock, black medic, oxalis, etc.

6. It permits the more efficient use of men and equipment.

7. For practical purposes, it is nonvolatile, therefore, much safer to use than such products as 2,4-D.

8. It has a short life in the soil, thus eliminating the residual problem associated with many pesticide products.

TABLE I — Effective MAINTAIN CF 125 Foliar Application Rates

Species	pts./100 Gal.*	Species	pts./100 Gal.*
Deciduous Hardwood		Shrubs	
Alder, Red	4-8	Abelia	1-2
Ash	1-3	Acacia	1-3
Cottonwood, Black	6-8	Calliandra	½-1
Elm, Siberian	2-4	Crape Myrtle	1-2
Maple, Big Leaf	1-2	Elaeagnus	1-2
Vine	1-2	Eugenia	½-1
Silver	2-4	Eunonymus	1-2
Willow, Golden	2-4	Hibiscus	½-1
Gymnosperms		Jasmine	1-2
Fir	⅓-1	Melaleuca	1-2
Juniper	⅓-1	Oleander	4-8
Pine	⅓-1	Plumbago	1-2
Spruce, Sitka	⅓-1	Privet	½-1½
Redwood	⅓-1	Pittisporum	1-2
Vines and Ground Cover		Xylosma	1-4
Ice Plant	2-4		
Ivy, Algerian	4-8		
English (Hahns)	1-2		

* Rates: 1 pint/100 gallons of water = 1 tsp./gallon = 150 ppm

Woody Plant Research

Preliminary tests in 1966 and 1967 with foliar applications of MAINTAN CF 125 indicated that it was a very active and effective growth inhibitor of woody plant species. In 1969, a major research effort was directed toward finding the most suitable rate, date, and type of application for the various species.

Species selected in various areas of the U.S. and Canada were those considered to be major problem trees in the cooperator's area of operation.

The 1970 woody plant testing program was limited to three MAINTAIN CF 125 formulations.

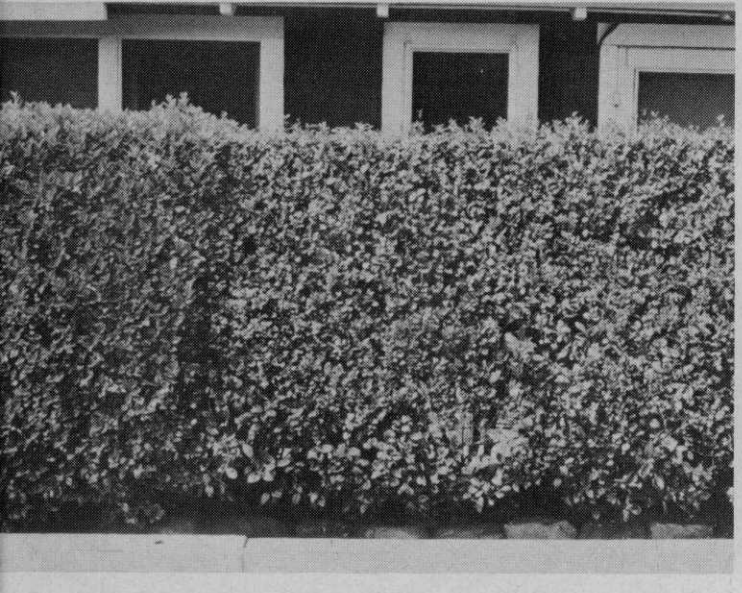
1. MAINTAIN CF 125 as a foliar spray at 10—1,250 ppm.

2. MAINTAIN A a O.25% and 1% asphalt tree wound dressing applied with an aerosol spray can or a paint brush.

3. MAINTAIN S as a 0.25% solvent formulation was tested as an aerosol spray, and as a concentrate to be diluted in No. 2 diesel fuel and applied with a conventional knapsack sprayer to bark only.

MAINTAIN CF 125 Foliar Applications

Cumulative research data from MAINTAIN CF 125 applied as a



CF 125 gave this kind of control at 100 ppm on this privet hedge in Monrovia, Calif.

Silver maple in the Davey Tree Expert Company test on the left got 200 ppm. The untreated is at right.

foliar spray from 1967 through 1970 have established the efficacy of the product on vines, shrubs and trees.

A foliage spray should be made after a flush of growth or after pruning and the new leaves have fully developed so that the plant is in the desired density, size and shape. Tender new growth may curl or twist. Flowering species treated before bud expansion may have a blossom reduction.

Applications generally maintain woody plants by inhibiting terminal growth that develops after treatment. In general, retardation holds for two months (on rapidly growing and frequently trimmed hedges), to six months on vines such as Algerian Ivy, or a year or more on deciduous hardwoods.

Gymnosperms (conifers, junipers, etc.) must be treated before buds expand in order to prevent distortion of new growth. Treatment when candles are tender often causes developing branches to droop.

Table I summarizes effective application rates for various species which have been successfully treated under field conditions.

Table III — 1970 Summary of Percent Growth Retardation from Use of MAINTAIN S

Species	Evaluation Months After Treatment	Percent Retardation	
		Sprout Length	Sprout Number
Ash	8	100	100
Camphor	3	4	78
Live Oak	5½	38	27
Osage-Orange	2½	100	100
Osage-Orange	2½	100	100
Scotch Pine	5	54**	
Scotch Pine	5	92**	
Sweet Gum	5½	0	91
Water Oak	5½	100	100
Water Oak	5½	63	83
Water Oak	3	100	100

* Knapsack Applications ** Twig Measurements

MAINTAIN A for Tree Wounds

This formulation was well received by people in the tree trimming industry as they are conditioned to painting cuts or "shiners" to keep them inconspicuous to casual observers, and to prevent infection by bacteria and fungi.

MAINTAIN A has effectively retarded sprouting and/or epicormic branching in the following species:

American elm, *Ulmus americana;* ash, *Fraxinus* spp.; bigtoothed aspen, *Populus grandidentata;* black locust, *Robinia pseudacacia;* black walnut, *Juglans nigra;* box elder, *Acer negundo;* camphor, *Camphor officinarum;* Chinaberry, *Melia azedarach;* decorative olive, *Oleaceae spp.;* golden willow, *Salix lasiandra;* hickory, *carya spp.;* Laurel oak, *Quercus laurifolia;* live oak, *Quercus virginiana;* osage-orange, *Maclura pomifera;* Norway maple, *Acer platanoides;* post oak, *Quercus stellata;* red oak, *Quercus rubra;* salt cedar, *Tamarix gallica;* silver maple, *Acer saccharinum;* sweet gum, *Liquidambar styraciflua;* sycamore, *Platanus* spp.; water oak, *Quercus nigra;* wild cherry, *Prunus emarginata;* yellow poplar, *Liriodendron tulipifera.*

Results indicate that MAINTAIN A:

1. inhibits the number and length of cambial and epicormic sprouts;

2. translocates primarily upward, but also to some extent downward

Annual bluegrass control is demonstrated here with CF 125.

This is 2½ months after a MAINTAIN combination treatment of annual grasses along a California roadside.

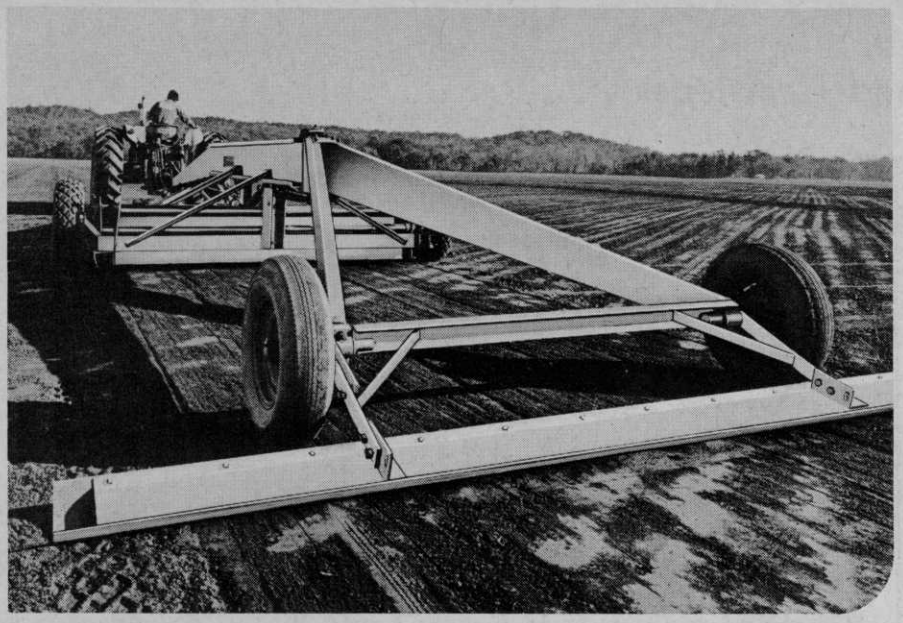


Table Top Surfaces

Leading sod farmers are using Eversman Automatic Land Levelers to make smooth, uniform seedbeds.

Also for golf courses, cemeteries, landscape architects.

Eversman Smoothers combine in one machine a field plane, open bottom scraper and a complete tillage tool for superior seedbed preparation. Smooth, level fields make possible even seeding, uniform germination with uniform turf maturity and faster, precision harvesting on fields that are easy on equipment.

The exclusive EVERSMAN Crank Axle.

The secret of the success of Eversman Land Levelers is the exclusive crank axle design. This principle is as simple as a child's teeter-totter. When one end goes up—the other goes down.

The leveler's main wheels are placed outside the cutting blade for a specific reason. These wheels serve as *feeler gauges*. They follow the contour of the field and automatically adjust the cutting blade to the correct depth—independently of the tractor driver.

When these gauge wheels come to a high spot or ridge, they ride up on top of the ridge and this forces the blade to lower and cut through the ridge. The soil is then carried along by the blade until the gauge wheels go into a hole or depression in the field, which forces the blade to raise and fill the depression.

Eversman offers land smoothers in sizes and price ranges to accommodate your size operation and your regular wheel tractors, from 3-plow to 5-plow models. (Blade widths 9' or 12', lengths of 32' or 45'.) Write for folder which gives complete information.

Eversman Manufacturing Company, Dept. S25, Curtis & Fifth Streets, Denver, Colorado 80204

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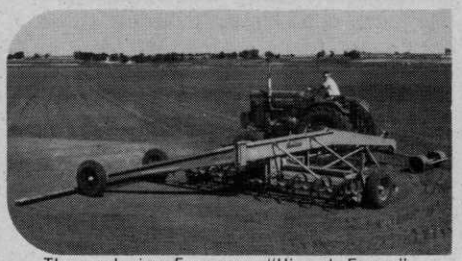
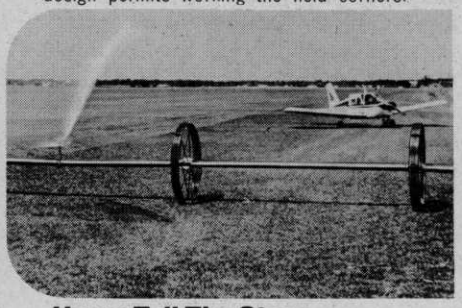


The exclusive Eversman "Hinged Frame" design permits working the field corners.



Users Tell The Story

"We have been using Eversman levelers for over fifteen years," writes Dale Habenicht of H & E Sod Nursery, Inc., Tinley Park, Illinois. "Several other types were tried, but we've always found the Eversman to be the most satisfactory. They give us the smooth surface we are looking for—with easy maneuverability.

"The H & E Sod Nursery operates three farms consisting of 1300 acres. I commute between farms with my Cherokee 180 and use the sod fields that have been leveled by the Eversman for landing strips."

"We could not properly prepare our seedbeds without the Eversman Leveler," writes Parker Sherling, Manager of Princeton Turf Farms, Inc., Centreville, Maryland.

"In preparing our fields," Parker Sherling continues, "we instruct our operators that a field is not ready until a car can be driven in any direction at 40 miles per hour over the field. It's a joke, but we actually bring our fields to this condition.

"Our operators have also developed the skill where we can shape our drainage ditches with the same machines, thus saving the rental of additional equipment."

from the painted cut to inhibit sprout development;

3. with 0.25% active ingredients gives adequate results;

4. aerosol spray and paint brush methods of application are both acceptable in the trade.

5. is a safe and effective chemical tool that assures maximum longevity and satisfactory appearance of a tree properly pruned.

Individual trees differ in growth habit, and many factors influence their growth and vigor. However, MAINTAIN A has proved its efficacy and superiority to accepted standards on many tree species under many conditions, including those considered to be major problems in the test regions. MAINTAIN A tends to promote healing of wounds.

Table II summarizes the percentage retardation obtained.

Table II — 1970 Summary of Percent Growth Retardation From Use of MAINTAIN A

Species	Evaluation Months After Treatment	Percent Retardation	
		Sprout Length	Sprout Number
Ash	8	76	83
Camphor	3	28	56
Live Oak	5½	13	37
Osage-Orange	2½	62	54
Norway Maple	3½	39	37
Silver Maple	1	65	52
Silver Maple	5	31	52
Sweet Gum	5½	0	72
Water Oak	6	20	74
Water Oak	6*	25	96
Water Oak	5½	94	88
Water Oak	5½	25	92
Water Oak	3	0	92
Water Oak	3	17	84

* 1% active ingredient

MAINTAIN S for Bark Treatment

MAINTAIN S has shown considerable potential on gymnosperms an deciduous hardwoods in retarding the growth at the terminal growing points and retarding sprouts which result from trimming.

Aerosol and knapsack spray methods have both been very effective. The knapsack applications are more effective when applied as a barkband treatment. This may be due to higher amounts of material being applied by this method.

A full season of growth control has been obtained from a single application.

Caution — MAINTAIN S is for bark treatment only; applications to foliage will cause burning. The product retards only that portion of the plant which develops after treatment.

Three different methods of applying MAINTAIN S were used successfully in 1970:

1. Bark band—main truck or specific limb treatments — material translocates to growing points and retards new growth.

2. Growth director—application to inside only of a "V" trimmed tree under a power line, or the side of a tree next to a building or power line. Use of this technique causes the growth to be "directed to untreated parts of the plant.

3. Pruned cuts — retards sprouts and epicormic branch development on and near the cut surface.

Table III summarizes the percentage retardation obtained from MAINTAIN S.

Although a heavy rate was used, a MAINTAIN combination treatment around trees in Vancouver, B.C., was satisfactory in appearance.

Crape Myrtle hedge on the left side of the foot bridge shows control with 300 ppm of CF 125, compared with the untreated hedge on the right side.

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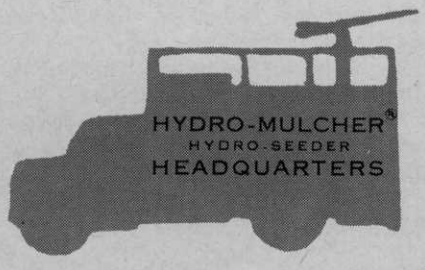

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FHA Announces Highway Awards

Seven state highway departments, a town in Washington, a city in Florida, and a gasoline service station have earned national recognition as examples demonstrating the compatibility of highways and the environment.

The Federal Highway Administration initiated the program three years ago. The objective was to recognize efforts of public and quasi-public bodies, civic and professional groups, and private industry to improve the environment adjacent to highways.

Competition attracted 723 entries from 123 contestants in 46 states.

The 11 category first place winners, and locations of the projects are:

1. Highway in its rural setting and environment; New York State Department of Transportation; section of Route 17 expressway in Sullivan and Delaware counties.

2. Highway in its urban setting and environment; City of Fort Lauderdale; improvement of Olas Blvd.

3. Bridge, overpass, tunnel approach, ramp or interchange area; Oregon State Highway Division; Interstate 80N viaduct around Tooth Rock Mountain.

4. Safety rest area; Michigan Department of State Highways; facility on Interstate 69 near Coldwater.

5. Highway-oriented private enterprise that preserves or improves the environment; town of Leavenworth, Washington; business section turned into Alpine village.

6. Multiple use of highway right-of-way; California Division of Highways; division's maintenance station built under Interstate 405 and Interstate 10 interchange.

7. Preservation of wildlife or natural areas; Wisconsin Division of Highways; preservation of scenic view on Highway 107 between Merrill and Tomahawk.

8. Preservation of historical sites; Alabama Highway Department; number of buildings in Mobile with historical significance saved in construction of Interstate 10.

9. Landscape treatment along roadsides and interchanges; California Division of Highways; State Highway 99 through Chico.

10. Screening or disposal of junked cars; Vermont Department of Highways; unique program for disposing of junked autos.

11. Outstanding motorist service station; Liberty Oil Company; station on U.S. 460 in Mt. Vernon, Ill.

Selected for honorable mention:

1. New Hampshire Department of Public Works; Interstate 89 from New London to Grantham.

2. City of West Palm Beach, Fla., improvement of Flagler Drive.

3. Washington State Highway Department; Cowlitz River arch span near town of Mossyrock.

4. California Division of Highways; Hunter Hill rest stop on Highway 80 east of Vallejo.

5. Tra Vel Information Center; on I-80 near Echo Junction in Utah.

6. City of Chicago; development of rail rapid transit facilities in median strip of Dan Ryan Expressway.

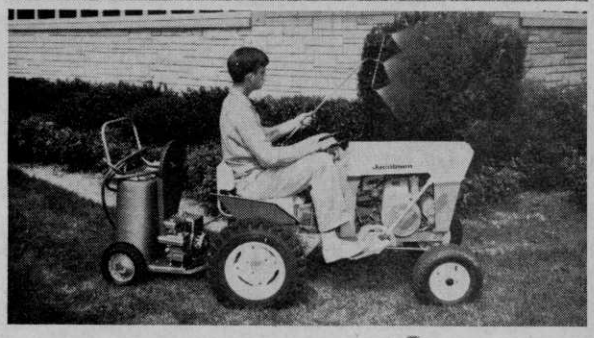
7. Wisconsin Division of Highways; borrow pit utilized for swimming beach on I-94, Millstone.

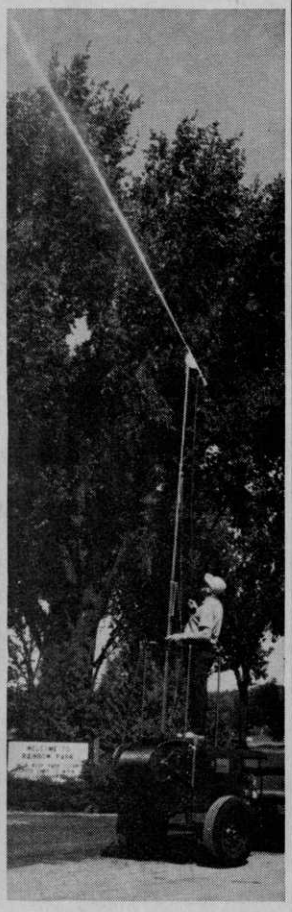
8. New Hampshire Department of Public Works; preservation of 234-year-old home of Gen. John Stark in Manchester.

9. Arizona Highway Department; landscaping I-8, Vekol Valley.

10. Wisconsin Division of Highways; screening of auto junkyard on U.S. 51 north of Stevens Point.

11. Shell Oil Company station on Highway 101 in Novato, Calif.





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Or step up to our Matador® sprayers. Choice of 3 or 5 gpm positive piston pump. Four tank sizes: 15, 30, 50, 100 gallons.

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CHAIN SELECTOR CHART

Cutting Job	Chain	Saw Size	Performance			Filing Method		Remarks
			Cutting Speed	Smoothness	Wood Cut per Chain	Recommend Round File and Holder	Requires Special Filing Technique	
Competition (for use in cutting contests)	80 Series	2 cu. in. larger	1st in wood under 30" diameter	1st	2nd		X	Fastest, smoothest chain made. For wood under 30" diameter. Use top file guide or sharpen automatically on saws equipped with "Power-Sharp."
	Chisel	4 cu. in. larger	1st in wood over 30"	2nd	1st		X	Fastest "Big Timber" chain. Sharpen with a chisel file.
Big Timber (wood over 30" in diameter)	Chisel	4 cu. in. larger	1st	1st	1st		X	Preferred by pros in "Big Timber." File with a chisel file. No file holder required. Not a chain for the week-ender. ½" pitch.
	Super-Chisel	3 cu. in. larger	2nd	2nd	2nd	X		A pro chain sharpened easily with a round file. Also available in chisel grind for sharpening with a chisel file .404" pitch.
	Micro-Chisel	2 cu. in. larger	3rd	3rd	3rd	X		New design. A chain of the future. Comes in a variety of sizes. Easy maintenance with round file and holder. Excellent in all woods.
	Micro-Bit	4 cu. in. larger	4th	4th	4th	X		Easy to sharpen. Not for small saws.
	Chipper	1.5 cu. in. larger	5th	5th	5th	X		Least expensive. Good general purpose chain. All sizes. ½" pitch standard on most gear drive saws.
Pulpwood and timber under 30" in diameter	80 Series	2 cu. in. larger	1st	1st	5th		X	Automatically sharpened on saws equipped with "Power-Sharp" or use top file guide (See Line 1).
	Super-Chisel	3 cu. in. larger	2nd	2nd	2nd	X		Good in all woods. Easy maintenance with a round file. Also available in chisel grind. .404" pitch.
	Micro-Chisel	2 cu. in. larger	3rd	3rd	3rd	X		New design makes this best all around performer. Easy maintenance with round file and holder. Fits most saws.
	S-70	2-6 cu. in.	4th	4th	1st	X		Long chain life. Fine all-around performer. ⅜" pitch.
	Chipper	1.5 cu. in. larger	5th	5th	4th	X		Least expensive. ½" pitch standard on most gear drive saws. Easy maintenance.
Limbing where kick-back is a problem	87	2 cu. in. larger	1st	1st	3rd		X	.325" pitch. Automatically sharpened on saws equipped with "Power-Sharp" or use top file guide (See Line 1).
	Speed-Guard	2-6 cu. in.	2nd	2nd	1st	X		Long chain life, easy maintenance with round file and holder, ⅜" pitch.
	Micro-Guard	4 cu. in. larger	3rd	3rd	2nd	X		.404" pitch. Designed for larger saws.
Farm choring and occasional use	80 Series	2 cu. in. larger	1st	1st	4th		X	Automatically sharpened on saws equipped with "Power-Sharp" or use special guide for "Goof-Proof" filing (See Line 1).
	Micro-Chisel	2 cu. in. larger	2nd	2nd	2nd	X		New design makes chain top all-around performer. Fits all saws including lightweights.
	S-70	2-6 cu. in.	3rd	3rd	1st	X		Long chain life. Fine all-around performer. ⅜" pitch.
	Chipper	1.5 cu. in. larger	4th	4th	3rd	X		Least expensive. Easy maintenance. ½" pitch is standard on most gear drive saws.

Keep this chart

OREGON Saw Chain Division OMARK INDUSTRIES

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IF WAGE-PRICE CONTROLS

IF YOU DON'T FACE the fact of possible wage-price restraints, when they come—if they come—they may restrain you right out of business. For inflation is not likely to stop or even be mitigated. In the charged political atmosphere with both parties looking to the next Presidential elections, controls are an answer many are considering.

Happily, there are steps you can take now to avoid being washed out in the wave of controls which may be upon us in the near future. It is necessary first to understand how we got where we are.

Present inflation, for which wage-price control cures are sought, has had three causes. Classic inflation begins with more money chasing the same goods. This condition began to be operative in the late years of the Sixties when the Federal Reserve expanded money supply at a frighteningly fast rate. The average rate of increase during post World War II years was about 2.5%. This kept pace with increase in productivity. Far faster than productivity increases, however, were the swollen 6% money stock increases that came later.

Worried about this and about the inflationary price escalations that had come about as a result of the increased supply of money chasing only slightly increased supplies of goods, the Federal Reserve in 1969 stopped money supply growth. Predictably, the economy began to turn over like a dying whale as recession took hold. Again alarmed, the Federal Reserve in 1970—while still talking monetary restraint—began to inflate the money supply once more. From February 1970 to June 1970, money supply increased at a 9.8% (annual) rate of growth. The year's rate was 5.4%.

Meanwhile, prices tended to increase even faster than they had before stringency had been prescribed as the cure for inflation. This occurred because a second cause of inflation took over—cost-push.

Consider what wage increases mean. A manufacturer's costs go up. So he raises the price by a small percentage and ships his merchandise to the wholesaler. The truck line which carries the goods must pay higher wages. It, too, raises the tab for carrying the goods to the distributor. Now the distributor has increases to meet. He raises his price accordingly. And in order not to be swamped under the increases, he is forced to add a normal mark-up to the increases themselves. Then he ships to the retail store. Again, the merchandise moves in union-manned trucks and again the cost of transportation is higher, so that there is a series of increases on the cost by the time this merchandise reaches the retailer. He, too, is compelled to add his regular mark-up percentage to the increases themselves as well as to the old base price. Now, when the merchandise reaches the consumer, the percentage is no longer small. The price has been upped a great deal. Inflation feeds on itself.

When the Fed's whopping 1970 increase in money supply was added to this, a third cause of inflation entered. Monetary inflation caused cost-push. Cost-push fed on itself. A new round of money buildup threatens to accelerate the process.

It's frightening. That is why some people are calling desperately for wage and price controls in the hope of stopping inflation. These controls will probably come. But the hope that they might cure inflation is probably a forlorn one. One of the country's monetary experts, Darryl Francis, president of the Federal Reserve Bank of St. Louis, stated the fact succinctly when he said: "Direct controls, like a new paint job over a termite-infested house, hide the evidence but do nothing to eliminate the cause."

Wage and price controls are not entirely without effect, however. They have, in fact, always brought two effects into existence. The imposition of these controls can probably be counted upon to produce the same effects again and if you are to survive profitably, you have to know what they are and plan to meet them.

The first effect of price-wage controls is usually scarcity. When a product cannot be produced profitably, its maker switches his production to other products which he hopes will not be controlled as closely or possibly will escape controls. "Unpatriotic!" scream advocates of price-wage controls when this happens. They may be correct, but that does not alter the fact that scarcities of low-profit or no-profit items will develop under price controls.

No businessman can continue production at a loss and stay in business; nor is he likely to continue with a tiny profit when by changing to another area he can switch back to the profit path. This is likely to be especially true because of the continuing inflation under which we live; it soon erodes whatever buying value the small profit might possess.

Scarcities are likely to develop in labor, too, despite high unemployment rates of the present. "Unemployment makes a man want to work at whatever wage he can get," insist the advocates of controls. "Soon labor costs will go down." This is a nice theory but, like the idea that wage-price controls won't bring about product scarcities, this argument contains more wishful than effective thinking. Labor has alternatives to working at controlled wages; unemployment insurance and, in many cases, welfare.

Raises now might help if they are needed to bring salaries in line with prevailing conditions. But over the longer term, many find that employee loyalty is best built by means of fringe benefits which are not immediately taxed out of the employe's pay envelope and which tend to bind up his longterm interests with yours.

The next thing that wage and price controls bring about is **slimmer profit margins.** Despite controlled prices of things you buy, other, less tangible and controllable costs usually go up and profit margins decline. So to survive it is wise to begin now to trim fat.

"One thing recessions bring about that is in the end beneficial to every business," commented an economist, "is awareness of the fat on corporate bodies. In boom times,

* Author of HOW YOU CAN BEAT INFLATION, NINE ROADS TO WEALTH, SIX STEPS TO INVESTING SUCCESS, HOW TO MAKE MONEY WITH MUTUAL FUNDS, PRACTICAL WAYS TO BUILD A FORTUNE IN THE STOCK MARKET, HOW TO CHART YOUR WAY TO STOCK MARKET PROFITS, HOW TO MAKE YOUR MONEY DO MORE (THE COMPLETE STOCK MARKET ADVISER), MANAGE YOUR MONEY—LIVE BETTER; past-president, Financial Analysts of New Orleans.

By DAVID L. MARKSTEIN*

COME?

executives say, 'Who, us? Fat? Nonsense. Our costs are as far down as they can get.' But when the bite comes, every company from the giants to the Mom and Pop businesses find ways to trim off costs."

Don't wait until the bite clamps too hard onto the profit and loss statement. Plan now for trimming away unneeded cost items. The first step is to institute strict accounting of everything.

"I was amazed," one nurseryman told me, "what a cost audit showed. Almost 15% of our total overhead was subject to elimination!"

A sound way to conduct such an audit—expensive, perhaps, in immediate cost but possibly vital to survival under the stultifying iron hand of prolonged wage and price controls—is to require written reports of every operation performed in each department. These can be studied with the question in mind: "Is such a step necessary? Do we need this many people in the department? Are certain tasks easily combined? Are certain products or papers or equipment subject to reduction?"

A possible solution might be leasing. Leasing can include hiring contract personnel where possible. In addition to throwing the prolems of employee recruitment and training upon other shoulders than your own, a long-term contract can ensure the presence of labor, although not necessarily of the same faces, throughout the period when price controllers lay siege to your profits. Leasing might also ensure the institution's having equipment which is subject to later scarcities.

Leasing offers many advantages but some serious drawbacks, too.

Here are the advantages: (1) The big tax advantage of writing off expenses instead of maintaining a depreciation table; (2) decreased (sometimes eliminated) maintenance cost when leasing includes maintenance; (3) freeing of capital from long-term tie-up in fixed assets; (4) consolidation of accounts; (5) avoidance of troubles that arise from early equipment obsolescence; (6) fixed costs.

The disadvantages are: (1) failure to build up equity in leased assets; (2) loss of value when an asset—as can happen in a time of scarcity—increases in value by becoming hard to get; (3) costs of consolidated accounts which are sometimes higher than scattered small ones, and (4) lost of control.

Another possibility for wage-price control survival is a practice which was widely condemned during World War II price control days as hoarding. Call it stockpiling of vital supplies if you have semantic qualms. But do it if scarcity of needed items might render your operation marginal.

The need to do something about inflation is very real. Yet, observing past experience not only in the U.S. but in other advanced nations as well, it is doubtful that price or wage controls will prove the answer. That won't stop their imposition, however, nor silence the cry in a politically important year.

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When you become a grower of Warren's A-10, A-20, and A-34 bluegrasses, you will have a line of lawn grasses that out-perform all others and they will be exclusive with you in your market area.

Briefly, here's the story of these miracle bluegrasses. A-10 does well in hot humid climates. A-20 is resistant to all major grass diseases and A-34 tolerates up to 65% shade. A-10 is deep green in color and holds that color right through prolonged dry spells. A-20 greens up sooner in the spring and stays green longer in the fall. A-34 does equally well in full sun as it does in shade.

When you are a grower of Merion or other bluegrass strains, *you* have nothing more to offer than your competition has. With Warren's specialty grasses you set the pace and the price, because you have the finest lawn grasses yet developed, and that is not all:

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meeting dates

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Midwest Regional Turf Conference, Purdue University, Lafayette, Ind. Mar. 1-3.

Ground Maintenance Conference, University of Connecticut and Southern Connecticut Groundskeepers' Association, Waverly Inn, Cheshire, Conn. Mar. 3.

Southern Shade Tree Conference, Durham Hotel and Motel, Durham, N.C. Mar. 7-10.

Iowa Golf Course Superintendents Association, Hotel Kirkwood, Des Moines. Mar. 8-10.

Michigan Association of Landscape Architects management Conference, Holiday Inn South, East Lansing. Mar. 11-12.

Western Society of Weed Science, Denver Hilton Hotel, Denver, Colo. Mar. 16-18.

Williamsburg Garden Silver Anniversary Symposium, Williamsburg, Va. Mar. 21-26.

California Association of Public Cemeteries at Santa Cruz. Mar. 26-27.

Alabama-Northwest Florida Turfgrass Association spring meeting in Birmingham, Ala. Apr. 5 and 6.

Arizona Turfgrass Conference at the Holiday Inn North in Tucson. Apr. 6-7.

American Society of Consulting Arborists fifth annual meeting. Crystal City Marriott Motel, 1999 Jefferson-Davis Highway, Arlington, Va. Apr. 11-13.

Florida Turf-Grass Trade Show at the Sarasota Motor Hotel, Sarasota. May 9-12.

Southern California Turfgrass Institute at California Polytechnic Institute, Pomona. May 18-19.

Grassland '71 fourth annual field day. Eugene, Ore., Municipal Airport. June 23-27.

California Landscape Contractors Association at King's Castle, Lake Tahoe. June 23-27.

47th International Shade Tree Conference at the Queen Elizabeth Hilton Hotel in Montreal, Quebec, Canada. Aug. 8-12.

Alabama-Northwest Florida annual turfgrass short course in cooperation with Auburn University, Auburn, Ala. Sept. 9-10.

Florida Turf-Grass Management Conference, Pier 66, Ft. Lauderdale. Sept. 19-22.

Midwest Regional Turf Foundation field day, Purdue University, Lafayette, Ind. Sept. 27.

30th Annual Short Course for Roadside Development, Columbus, Ohio. Oct. 4-8.

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Until recently chemical control of aquatic vegetation has been a big disappointment. Either it didn't work at all or it destroyed things indiscriminately. Diquat solves both problems. It's highly effective against a broad variety of both floating and submerged weeds. It's amazingly fast acting and easy to apply. Nor does it stay around long because it's deactivated on contact with soil in any form.

Diquat when used as directed is safe for fish, too. In fact, the safe levels of Diquat to fish are 2 to 4 times greater than the maximum dosage recommended. You use it with complete confidence.

Diquat is specially recommended for eliminating weed congestion in boating areas, ponds, lakes, residential water fronts, drainage canals, and commercial waterways.

Look around your town, your county. You probably know of dozens of places needing the ORTHO Diquat treatment right now.

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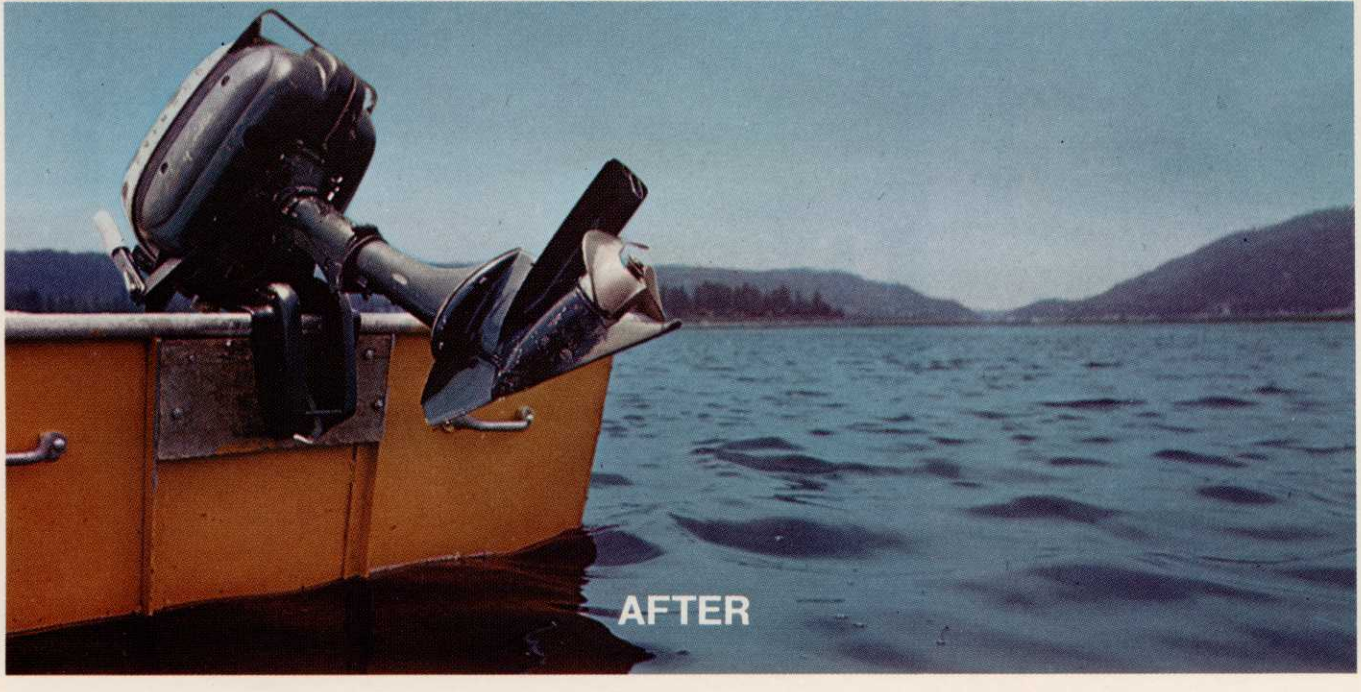

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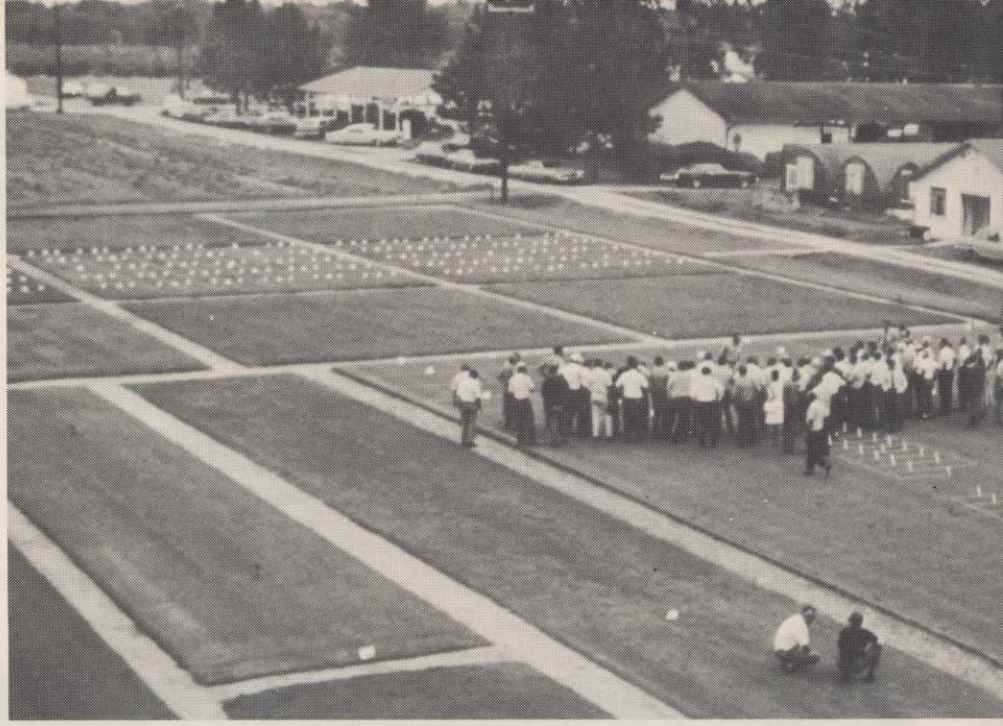
Soil Effects from Nitrogen Sources

Fertigation

Pest Control

FLORIDA RESEARCH



What effect on a sandy soil low in both organic matter and clay does heavy nitrogen fertilization cause? What are the prospects for "fertigation?" Weed control in Bahiagrass? New nematicides?

These questions were among discussions at the recent 18th annual Florida Turfgrass Management conference. About 400 turf specialists attended.

Dr. G. C. Horn, department of ornamental horticulture, University of Florida, reported on a nitrogen source study in 1970 on Tifgreen bermudagrass maintained under putting green conditions. The soil had been amended, he said, with 20% vermiculite, 5% colloidal phosphate, 10% peat and 10% fired clay (by volume) to a depth of six inches.

One-half pound of N applied every other week had a "pronounced effect" on soil pH, the magnitude of which was determined by the nitrogen source, he said.

"Urea and ammonium nitrate, when applied at ½#N per 1,000 sq. ft., every other week has less effect

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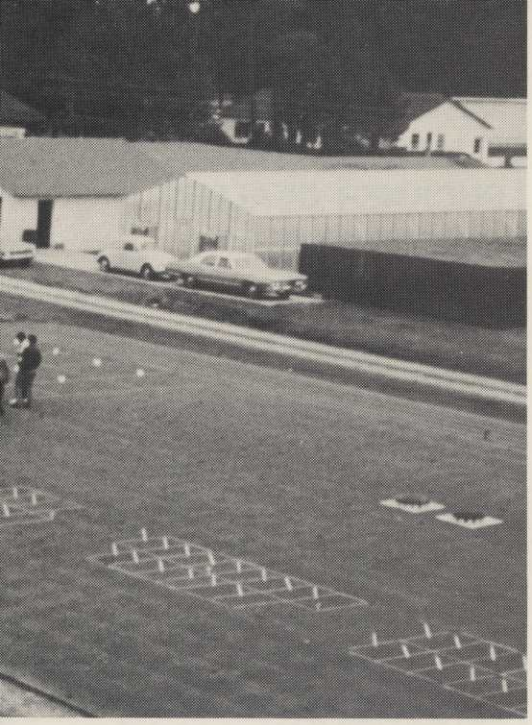

Turf management specialists inspect research plots at the University of Florida.

on soil pH than either ammonium sulfate or calcium nitrate. Both ammonium nitrate and urea were slightly acid-forming but not nearly so much as ammonium sulfate."

The equivalent of two tons of dolomite limestone per acre was added in July to all plots. Ammonium nitrate and urea left the pH at 6.4, but ammonium sulfate changed it to 4.8 and calcium nitrate to 7.2.

When twice the amount of nitrogen was added, Dr. Horn reported, the soil pH was affected differently. Application of ammonium nitrate ½#N weekly lowered the pH more than 1#N applied every other week. The reverse was true for urea and ammonium sulfate. Calcium nitrate weekly at ½#N per 1,000 sq. ft. lowered the soil pH one unit lower than 1#N applied every other week. (Table 1) The effect on pH of applying one pound of N weekly throughout the year is shown in Table 2.

Data on effects of organic sources of N showed that sewerage sludge, at all rates, maintained soil pH at an optimum level. The pH ranged from 6.5 at lower rates to 6.2 for higher rates. Ureaformaldehyde sources were acid forming at low as 4.0), more so than ammonium sulfate (5.7). Dr. Allen's true organic had a tendency to increase the pH (to 7.0) throughout the year, Dr. Horn reported.

Nitrogen source affected levels of calcium, but with the rate of application rather than source bringing the greatest change. Dr. Horn found that both source and rate of N affects magnesium levels. As the rate of N was increased, the level of available magnesium found in the soil decreased. Ammonium sulfate and calcium nitrate were more detrimental, he said.

Ureaformaldehyde forms of N lowered available soil phosphorus more than other sources, he continued. Highest levels of soil potassium were found when sewerage sludge was added. Ammonium sulfate resulted in the next highest level of available K.

Pros and Cons of "Fertigation"

A study of applying fertilizer through the irrigation system has been initiated at the Plantation Field Laboratory, Ft. Lauderdale. The purpose will be to verify presently claimed advantages and disadvantages and to perhaps discover others. Dr. G. H. Snyder listed these advantages:

1. Labor needed for fertigation is only slightly greater than for irrigation alone.
2. Good surface distribution will be obtained.
3. Good control on depth of placement of certain fertilizers, such as nitrogen, is possible.
4. Nutrients already in solution will become available to plants sooner than when applied dry on the soil surface.
5. It is much easier to control leaching of fertigation - applied fertilizer.
6. Less fertilizer may be required.

Dr. Snyder said the disadvantages include:

1. An improperly designed irrigation system will not give equal fertilizer distribution to an entire turf area.
2. If rain occurs in sufficient quantity for the turf at a time when fertilization is needed, it may be necessary to over irrigate just to apply fertilizer.
3. Often the lower cost fertilizer materials cannot be used.
4. Certain phosphatic materials

TABLE 1. Effects of 2#N per month on soil pH.

Source	1#BW	½#W
Ammonium Nitrate	5.6	5.4
Urea	5.8	6.1
Ammonium Sulfate	4.3	4.7
Calcium Nitrate	7.4	6.2
Average	5.78	5.60

TABLE 2. Effects of 1#N weekly on soil pH.

Source	pH
Ammonium Nitrate	4.2
Urea	4.4
Ammonium Sulfate	4.4
Calcium Nitrate	5.9

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will concentrate near the soil surface, whereas some nitrogen may be lost into the air when applied with irrigation water.

5. Improper handling of the fertilizer may damage the irrigation system.

"Just as some of the advantages could be voided by improper management, so could some of the disadvantages be overcome by proper management," summarized Dr. Snyder.

"Fertilization of turf through the irrigation system is potentially a labor-saving device which should result in the production of quality turf with minimum of fertilizer loss through leaching. However, this will be dependent upon a well-designed irrigation system."

Weed Control Research

Dr. Evert O. Burt of the Plantation Field Laboratory, summarized other research:

—weed control in St. Augustinegrass. Atrazine at 2 lb. ai/a on sandy soils, or 4 to 5 lbs. ai/a on organic soils has continued to give good control of broadleaf weeds, except creeping beggarweed. Usually good control of water sedge is obtained. Good to poor control of annual grasses, such as crabgrass and bullgrass is obtained when atrazine is used prior to seed germination. Control of grassy weeds in St. Augustine can best be achieved by three or four applications of atrazine at the recommended rate over a 12-month period.

Some atrazine injury had been reported, but Dr. Burt said it most likely occurred on turf under stress for other reasons.

—weed control in bahiagrass. 2,4-D gives good control of most broadleaf weeds, except beggarweed and oxalis. For controlling this pair, use silvex or dicamba. Research during the past three years has shown that many grassy-type weeds were controlled with paraquat. This treatment, Dr. Burt emphasized, gives complete top kill of all vegetation, including bahiagrass, but bahiagrass resprouted quickly. Two light applications were better than one heavy dosage, he said.

If the stand is thin, and not to be reseeded, he advised using a preemergence herbicide, such as Azak, Balan, Dacthal, Presan, or Betasan.

—Two new nematicides, Tirpate and Nemacur, have given excellent control of nematodes and are safe for use on the five warm-season turfgrasses. Label approval, however, is still pending.

—Bermudagrass mite is becoming an increasing problem in south Florida, found primarily on coarse textured bermudas, such as common, St. Lucie, Ormond, and Tifway.

—In 1969 and 1970, six experiments were conducted on the germination and stand of bahiagrass and ryegrass as affected by depth of seeding. Four were given adequate moisture; two under drought conditions. Seeds were planted at 0, 0.5, 1.0, 1.5 and 2.0 inches. Deep planting gave as good, or better, germination as shallow planting. Under dry conditions, the surface and half-inch depth resulted in poor germination. Under good moisture, the half-inch gave germination equal to greater depths.

New Officers

Leroy Fortner succeeded Bill Colburn as president of the Florida Turf-Grass Association. Other officers are: Vice-president — William F. Lewis; secretary-treasurer, Charles G. Mascaro; and directors—Charles Butterworth; supplier; John Parker, cemeteries; C. David Peeling, landscape; Robert B. Sanderson and Joseph F. Yuzzi, golf; Guy W. Smith, public turf; and Michele W. Valletta, mobile parks.

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Watsons Distributing Co.
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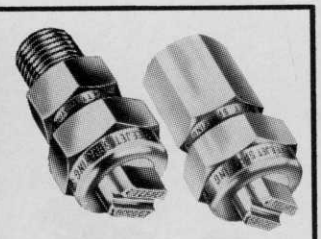

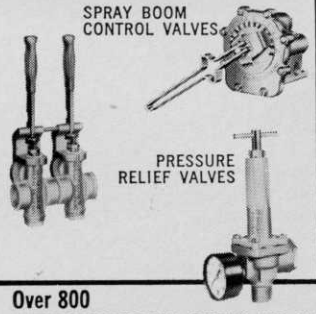

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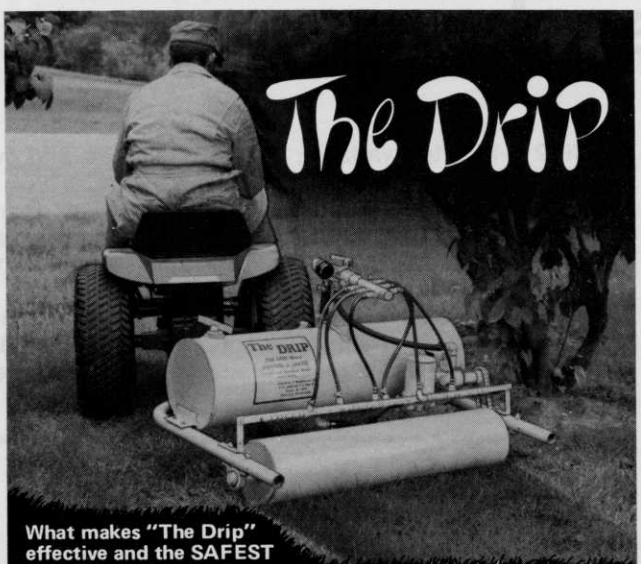

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insect report

TURF INSECTS

A BILLBUG

(Sphenophorus phoeniciensis)

CALIFORNIA: Adults 15 per square yard in Tifgreen lawn at San Diego, San Diego County.

A MARCH FLY

(Dilophus orbatus)

CALIFORNIA: Larvae heavy in lawns at Santa Maria, Santa Barbara County.

INSECTS OF ORNAMENTALS

A CONIFER APHID

(Cinara tujafilina)

OKLAHOMA: Increasing on Payne County arborvitae. Older, undisturbed colonies range up to 75 aphids each and many small, newly formed colonies found in favorable locations. Numbers of alate aphids increased slightly but this stage still not common.

WHITE PEACH SCALE

(Pseudaulacaspis pentagona)

VIRGINIA: Severe and widespread on Kwansan cherry in City of Alexandria.

IVY APHID

(Aphis hederae)

OREGON: Nymphs and adults spotty, mostly adults found on young shoots of English ivy at Salem, Marion County. This is a new state record.

TREE INSECTS

PEACHTREE BORER

(Sanninoidea exitiosa)

TENNESSEE: Infestation light but tree damage heavy on flowering almond in Warren County.

AN ERIOPHYID MITE

(Eriophyes canestrinii)

OREGON: Heavy under leaf scales of boxwood at Corvallis, Benton County. This species forms small flower gall but generally not considered injurious to host. This is a new state record.

PINE TUBE MOTH

(Argyrotaenia pinatubana)

MISSOURI: Larvae collected from white pine at Chesterfield, St. Louis County. This is a new state record.

PITCH PINE TIP MOTH

(Rhyacionia rigidana)

MISSOURI: Collected at Licking, Texas County, on loblolly and shortleaf pines. This is a new state record. The following are new county records: Elsberry, Lincoln County; Willow Springs, Howell County; Eugene, Miller County; and Gladden, Dent County on shortleaf pine.

ASIATIC OAK WEEVIL

(Cyrtepistomus castaneus)

MISSOURI: Adults collected from oak in Dallas County. This is a new county record.

ENGRAVER BEETLES

(Ips sp.)

CALIFORNIA: Infested knobcone pine saplings and poles in two stands of 1,000 to 1,500 acres in Coffee Creek area, Shasta National Forest. About 5,000 trees involved.

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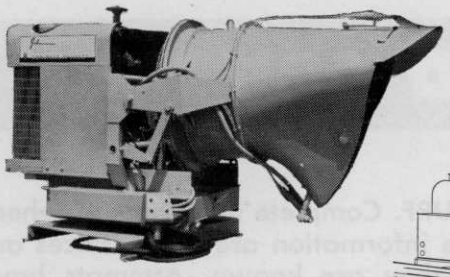

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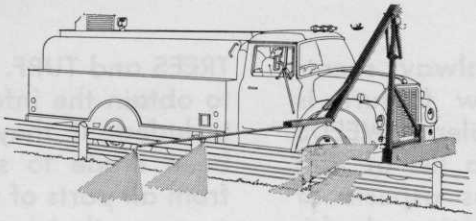

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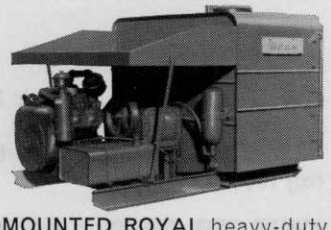

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INFORMATION INDEX

REFERENCES FOR WEED CONTROL

Information is a commodity that always seems to be in short supply. This new feature is designed to alleviate that problem. WEEDS TREES and TURF has compiled a list of 400 references that relate to various aspects of weed control — species identification, herbicides, equipment, control techniques, successful programs, and so on. The references have been gathered from universities, industry, government, professional associations, book publishers, and from the back issues of WEEDS TREES and TURF. Complete addresses of where to obtain the information are listed. Prices are included, if they are known. Attempts have been made to secure sources of information from all parts of the country. If you have found a source that has proved helpful and it is not listed, let us know. Extra copies of this reference index for weed control are available at $1.00 per copy. Write WEEDS TREES and TURF, 9800 Detroit Ave., Cleveland, Ohio 44102.

Weed Identification And Control Methods

References carrying an asterisk (*) indicate these are not available to out-of-state residents.

ALGAE, An easy way to keep a pond free. WTT article. Xerox copy 75¢.

ALGAE CONTROL IN INLAND WATER by S. J. Toth and D. N. Reimer, Department of Soils and Crops, Rutgers University. WTT article. Xerox copy 75¢.

ALLIGATOR WEED and the Agasticles flea beetle by Robert N. Hambric, aquatic biologist, Texas Parks and Wildlife Department, Houston, WTT article. Xerox copy 25¢.

ALLIGATOR WEED eradication by William R. Clark, Visalia, Calif. WTT article. Xerox copy 75¢.

AMIZINE for use around highway ornamental plantings. No. 2470. Free. Amchem Products, Inc., Ambler, Pa. 19002.

ANTI-TRANSPLANT 50-page technical manual of applications. Free. Wilt-Pruf, Nursery Specialty Products, Inc. 410 Greenwich Ave., Greenwich, Conn. 06830.

AQUATIC AND BANK WEEDS, Research Techniques and Challenges are unique. By F. L. Timmons, leader of weed investigations, USDA Agricultural Research Service, Laramie, Wyo. WTT article. Xerox copy 75¢.

AQUATIC VEGETATION OF NEW JERSEY—Ecology and Identification, Problems and Methods of Control. E 382, $1.50. Bulletin Clerk, College of Agriculture and Environmental Science, Rutgers Univ., New Brunswick, N. J. 08903.

AQUATIC WEED CONTROL. 219B, Free. Agricultural Extension Service, Univ. of Fla. Gainesville, Fla. 32601.

AQUATIC WEED CONTROL, carbon dioxide laser. WTT article. Xerox copy 75¢.

AQUATIC WEED CONTROL, Hydrionic Method for controlling weeds in running water, by Robert W. Hyde, Crystal River, Fla. WTT article. Xerox copy 75¢.

AQUATIC WEED CONTROL in potable water by Raymond V. Corning, Virginia fish biologist. WTT article. Xerox copy 75¢.

AQUATIC WEED CONTROL of Stockbridge Bowl by Jason M. Cortell, aquatic biologist, Allied Biological Control Corp., Wellesley, Mass. WTT article. Xerox copy 75¢.

AQUATIC WEED CONTROL, Total Lake Management by Norman J. Schein, lake biologist, Onalaska, Wis. WTT article. Xerox copy 75¢.

AQUATIC WEED CONTROL, USDA report on hydrilla verticillata by Robert D. Blackburn and Lyle Weldon, Agricultural Research Service, Ft. Lauderdale, Fla. WTT article. Xerox copy 75¢.

AQUATIC WEED CONTROL with Ortho Diquat. 12-page booklet. Free. Chevron Chemical Co., Ortho Div., 200 Bush St., San Francisco, Calif. 94120.

The Dow Chemical Company, Agricultural Department, Midland, Michigan 48640.

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AQUATIC WEED HARVESTING by Brate Bryant, president of Aquamarine Corporation, Waukesha, Wis. WTT article. Xerox copy 75¢.

AQUATIC WEED SERVICE, 3M Company. WTT article. Xerox copy 25¢.

AQUATIC WEEDS—Their Identification and Methods of Control Fishery Bulletin #4, Free. Division of Fisheries, Room 102 State Office Building, Springfield, Illinois 62701.

ARKANSAS LAWN WEEDS—EC 528, Free. Agricultural Extension Service, P.O. Box 391, Little Rock, Arkansas 72203.

BANVEL HERBICIDE. 8-page booklet. Free. Velsicol Chemical Corp., 341 East Ohio St., Chicago, Ill. 60611.

BARBERRY ERADICATION—E600, Free. MSU Bulletin Office, P.O. Box 231, East Lansing, Michigan 48823.

BETASAN control of crabgrass and poa annua in greens and turf. 16-page guide. Free. Stauffer Chemical Co. Agricultural Chemical Division, 299 Park Avenue, New York, N.Y. 10017.

BETASAN control of crabgrass and poa annua in turf. No. A-10172R. Free. Stauffer Chemical Co., Agricultural Chemicals Div., 299 Park Ave., New York, N.Y. 10017.

BI-FLUID SPRAY SYSTEM by David Petersen, president of KDM Company. WTT article. Xerox copy 75¢.

BLUE FLOWERING LETTUCE, PNW106, Free. Mailing Room, College of Agriculture, Agri. Science Bldg., Univ. of Idaho, Moscow, Idaho 83843.

BROADCAST SPRAYING—EB-229, Free. Agricultural Publications Distribution, Agricultural Publications Annex, Univ. of Md., College Park, Md. 20742.

BULRUSHES & BULRUSHLIKE PLANTS OF EASTERN NORTH AMERICA, Circular 221, 20¢. U.S.D.I., Fish & Wildlife Service, "C" St. Between 18th & 19th, Washington, D.C. 20204.

CALIBRATION OF PESTICIDE APPLICATORS, 275A, Free. Bulletin Room, Cooperative Extension Service, Room G031, McCarty Hall, Univ. of Florida, Gainesville, Fla. 32601.

CALIBRATING SPRAYERS by Herb P. Hill, John Bean Division, FMC Corporation. WTT article. Xerox copy 75¢.

CANADA THISTLE, Ext. 338, Free. Mailing Room, College of Agriculture, Agri. Science Bldg., Univ. of Idaho, Moscow, Idaho 83843.

CANADA THISTLE AND ITS CONTROL, No. A1.35: 523/2, 5¢. Superintendent of Documents, U.S. Govt. Printing Office, Washington, D.C. 20402.

CANADA THISTLE AND ITS CONTROL,* L523, Free. Information Office, Extension Service, University of Nebraska, Lincoln, Nebraska 68503.

CARE AND MAINTENANCE OF MERION LAWNS, Free. Merion Bluegrass Association, 101 Park Ave., New York, N.Y. 10017.

CARE OF LAWNS, 452A, 10¢. Bulletin Room, Colorado State Univ. Fort Collins, Colo. 80521.

CHEMICAL APPLICATION RECORD, FS AgChem 2, 2¢. Bulletin Room, 3 Coffey Hall, Univ. of Minn., St. Paul, Minn. 55101.

CHEMICAL CONTROL OF WOODY PLANTS, B812, Free. Agricultural Publications, 207 University Hall, Univ. of Calif., Berkeley, Calif. 94720.

CHEMICAL CONTROL OF WOODY WEEDS, FS For 5, 2¢. Bulletin Room, 3 Coffey Hall, Univ. of Minn., St. Paul, Minn. 55101.

CHEMICAL HERBICIDES FOR HORTICULTURAL CROPS, 148, Free. Resource Information Off., 16 Woodward Hall, Univ. of Rhode Island, Kingston, R.I. 02881.

CHEMICAL "LAWN MOWERS"—HOW CLOSE TO PERFECTION? Fs1227, 3¢. Publications Distribution Center, Printing and Publications Bldg., Iowa State Univ., Ames, Iowa 50010.

CHEMICAL PREPLANT CONTROL OF JOHNSONGRASS, EL 348, Free. Agricultural Extension Service, P.O. Box 391, Little Rock, Ark. 72203.

CHEMICAL SURFACTANTS. Free. Rhodes Chemical Co., Gate, Wash. 98545.

CHEMICALS THAT CONTROL WEEDS, 70 EC70-130, 10¢. Information Office, Extension Service, University of Nebraska, Lincoln, Neb. 68503.

CHEMICAL WEED CONTROL, NURSERY CROPS, MM297, 25¢. Extension Office of Information, The Ohio State University, 2120 Fyffe Rd., Columbus, Ohio 43210.

CHEMICAL WEED CONTROL FOR FLORIDA VEGETABLE CROPS, 196B, Free. Bulletin Room, Cooperative Extension Service, Room G031, McCarty Hall, Univ. of Fla., Gainesville, Fla. 32601.

CHEMICAL WEED CONTROL FOR IRRIGATED AREAS, A-1, Free. See Local County Extension Agent, Arizona.

CHEMICAL WEED CONTROL IN CITRUS, 191, Free. Agricultural Publications, 207 University Hall, Univ. of Calif., Berkeley, Calif. 94720.

CHEMICAL WEED CONTROL IN CROPS, 1969, SB522, Free. Distribution Center, Umberger Hall, Kansas State Univ., Manhattan, Kansas 66502.

CHEMICAL WEED CONTROL in Conifer Plantations (Oregon and Washington west of the Cascades) Atrazine Information Sheet No. 23, Free. Geigy Agricultural Chemicals, Saw Mill River Rd., Ardsley, N.Y. 10502.

CHEMICAL WEED CONTROL IN CROPS—1970, FS498, Free. Bulletin Room, South Dakota State Univ., Brookings, South Dakota 57006.

CHEMICAL WEED CONTROL IN FIELD CROPS, FS-13, Free. Agricultural Publications Distribution, Agricultural Publications Annex, University of Md., College Park, Md. 20742.

CHEMICAL WEED CONTROL in flowers and ornamentals. Free. Stauffer Chemical Co., Agricultural Chemicals Division, 299 Park Ave., New York, N.Y. 10017.

1968 CHEMICAL WEED CONTROL IN FORESTRY AND HORTICULTURAL CROPS, SB-516, Free. Distribution Center, Umberger Hall, Kansas State University, Manhattan, Kansas 66502.

CHEMICAL WEED CONTROL IN LAWNS, IG 1, Free. Mail Service, Hewitt Hall, Durham, New Hampshire 03824.

CHEMICAL WEED CONTROL in ornamental plantings. Simazine Information Sheet No. 27, Free. Geigy Agricultural Chemicals, Saw Mill River Rd., Ardsley, N.Y. 10502.

CHEMICAL WEED CONTROL IN PASTURE, RANGE AND HAYLAND, FS 426, Free. Bulletin Room, South Dakota State Univ., Brookings, South Dakota 57006.

CHEMICAL WEED CONTROL IN TREES, A418-Free. Agri. Information Dept., Univ. of N. Dak., Fargo, N. Dak. 58102.

CHEMICAL WEED CONTROL IN TREES, FS 414, Free. Bulletin Room, South Dakota State Univ., Brookings, South Dakota 57006.

CHEMICAL WEED CONTROL, ornamental plantings, with Princep. Free. Geigy Agricultural Chemicals, Saw Mill River, Rd., Ardsley, N.Y. 10502.

CHEMICAL WEED CONTROL, Industrial, Southwest. Free. Van Waters & Rogers, 4707 Alpha Rd., P.O. Box 34749, Dallas, Tex. 75234.

COMMERCIAL ORNAMENTALS WEED CONTROL GUIDE, 307A, Free. Bulletin Room, Cooperative Extension Service, Room G031, McCarty Hall, Univ. of Fla., Gainesville, Fla. 32601.

COMMON AQUATIC WEEDS, No. A1.76:352, 50¢. Superintendent of Documents, U.S. Govt. Printing Office, Washington, D.C. 20402.

COMMON LAWN WEEDS, 577-A, Free. University of Kentucky, Cooperative Extension Service, Agriculture and Home Economics, Lexington, Ky. 40506.

CONTROL AND ELIMINATION OF LEAFY SPURGE, FS449, Free. Bulletin Room, South Dakota State Univ., Brookings, South Dakota 57006.

CONTROL AND ELIMINATION OF NOXIOUS WEEDS, FS 448, Free. Bulletin Room, South Dakota State University, Brookings, South Dakota 57006.

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CONTROL OF WEEDS IN OKLAHOMA, E-582, Free. Agriculture Mailing Room, Oklahoma State University, Stillwater, Oklahoma 74074.

CREEPING SPEEDWELL, chemical control, by A. J. Burgeon and W. F. Meggitt of Michigan State University. WTT article. Xerox copy 75¢.

CREOSOTEBUSH CONTROL WITH PEHNOXY HERBICIDES, PICLORAM, AND FUEL OIL IN SOUTHERN NEW MEXICO, 554, Free. Bulletin Office, Dept. of Agri. Information, New Mexico State Univ., Drawer 3A1, Las Cruces, New Mex. 88001.

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A DESCRIPTIVE GUIDE FOR MAJOR NEBRASKA THISTLES, 67, SB493, 20¢. Information Office, Extension Service, University of Nebraska, Lincoln, Nebraska 68503.

DICAMBA AND MECOPROP, Tips for using. WTT article. Xerox copy 25¢.

DINOXOL for Basal Sprays on Brush. No. 1625D. Free. Amchem Products, Inc., Ambler, Pa. 19002.

DIRECTORY OF PERSONNEL ENGAGED IN WEED SCIENCE, $1.50. Weed Science of America, Remit to F. W. Slife, Dept. of Agronomy, Urbana, Ill. 61801.

DISPOSING OF EMPTY PESTICIDE CONTAINERS, FS AgChem 3, 2¢. Bulletin Room, 3 Coffey Hall, Univ. of Minn., St. Paul, Minn. 55101.

DIURON AND SIMAZINE FOR WEED CONTROL IN WALNUT ORCHARDS, 194, Free. Agricultural Publications, 207 Unviersity Hall, Univ. of Calif., Berkeley, Calif. 94720.

DUPONT Weed and Brush Control Recommendations for the Midwest. Free. DuPont Company, Industrial and Biochemicals Dept., 40—47th St., Western Springs, Ill. 60558.

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EPTAM for Weed Control in Flowers and Ornamentals. 8-page booklet. Free. Stauffer Chemical Co., 299 Park Ave., New York, N.Y. 10017.

THE EFFECT OF 2,4-D DICHLOROPHENOXYACETIC ACID ON CERTAIN WEED AND CROP SEEDS, T197, 20¢. Bulletin Room, Coffey Hall, University of Minn., St. Paul, Minn. 55101.

FIELD BINDWEED AND ITS CONTROL, L 496, Free. Publications Div., Office of Information, U.S. Dept. of Agri., Washington, D.C. 20250.

FIRE HAZARDS OF STORED PESTICIDES, FS AgChem 1, 2¢. Bulletin Room, 3 Coffey Hall, University of Minn., St. Paul, Minn. 55101.

FLYERS ON PESTICIDES, $7.00 per 1,000. National Agricultural Chemicals Association. The Madison Building, 1155 Fifteenth St. N.W., Washington, D.C. 20005.

FOREST WEEDING, 60-22, Free. Agricultural Publications, College of Agriculture and Natural Resources, University of Connecticut, Storrs, Conn. 06268.

GIANT FOXTAIL, EC457, Free. Agricultural Information, Agricultural Adm. Bldg., Purdue University, Lafayette, Ind. 47907.

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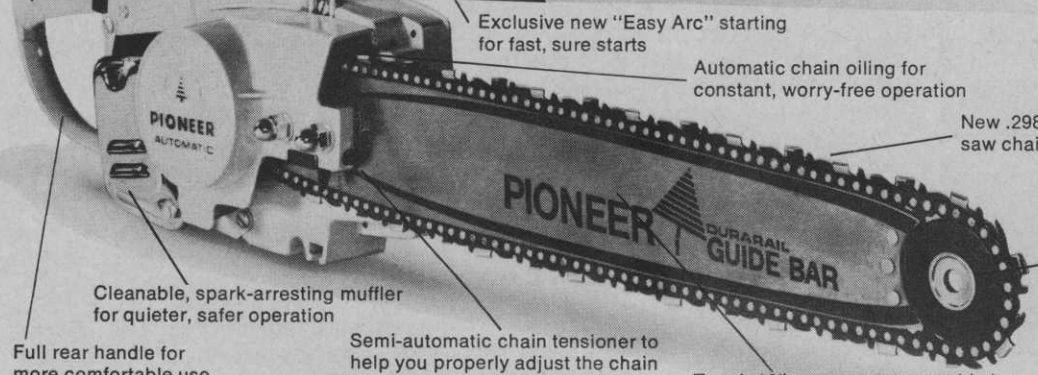

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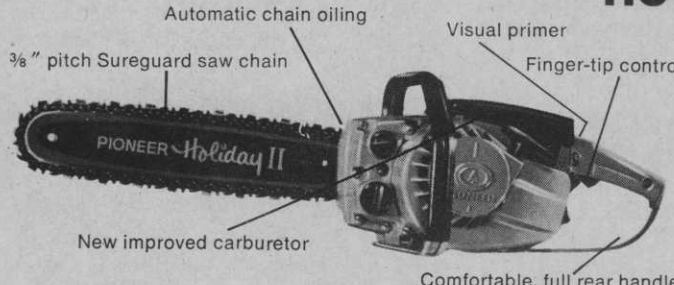

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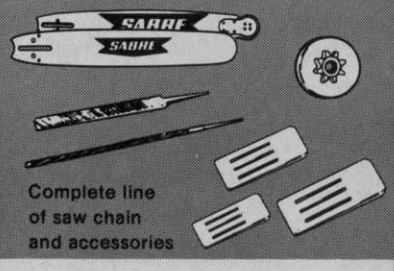

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HERBICIDES FOR BEGINNERS by Allen F. Wiese, professor of agronomy, Texas A&M WTT article. Xerox reprint 75¢.

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HERBICIDE USE AND NOMENCLATURE INDEX, $3.00, IPPC, Oregon State University, Corvallis-Oregon 97331.

HIGHWAY AND INDUSTRIAL WEED CONTROL. No. 600-137—Industrial Herbicide Application Calculator. No. 600-208—Weed Control in Ornamental Plantings. No. 600-211—Guide to Industrial Weed Control in Western States. No. 600-222—Geigy's Big Six Herbicides for Industrial Weed Control. 700-196B—Sprayer Calibration Pamphlet. No. 700-326—AAtrex and Atratol for All-Around Industrial Use. No. 800-021—Guide to Pramitol-Asphalt Primer Combination Applications. 700-490—Atratol 8 P (pelleted herbicide) Fact Sheet). 800-047A—Pramitol 5PS (pelleted herbicide) Fact Sheet. No. 800-039A—Pramitol 25E (liquid herbicide) Fact Sheet. Free. Geigy Agricultural Chemicals, Ardsley, N.Y. 10502.

HORSETAIL, PNW105, Free. Mailing Room, College of Agriculture, Agri. Science Bldg., Univ. of Idaho, Moscow, Idaho 83843.

HOW TO CONTROL NUTSEDGE (NUTGRASS) IN ARIZONA, F-139, Free. See Local County Extension Agent, Arizona.

HOW TO CONTROL JOHNSONGRASS, FS-178, Free. Agricultural Publications Distribution, Agricultural Publications Annex, Univ. of Md., College Park, Md. 20742.

HOW TO KILL CATTAILS by Bert Bordewick, Del Mar College, Corpus Christi, Tex., WTT article. Xerox copy 75¢.

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IMPROVEMENT OF MEDUSAHEAD-INFESTED RANGELAND, 123, Free. Agricultural Publications, 207 University Hall, Univ. of Calif., Berkeley, Calif. 94720.

IN DEFENSE OF PESTICIDES. Bulletin No. 107-70, Free. Wisconsin Department of Agriculture, Hill Farms State Office Bldg., Madison, Wis. 53701.

JOHNSONGRASS, BP-10-2, Free. Agricultural Information, Agricultural Adm. Bldg., Purdue University, Lafayette, Ind. 47907.

JOHNSONGRASS CONTROL IN ARIZONA, A-53, Free. See Local County Extension Agent, Arizona.

JOHNSONGRASS CONTROL ON DITCHBANKS, 1968, B527, Free. Bulletin Office, Dept. of Agricultural Information, Drawer 3A1, New Mexico State Univ., Las Cruces, New Mex. 88001.

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THE LAWN BOOK. 207-page book by Dr. Robert W. Schery. The MacMillan Company, 60 Fifth Ave., New York City, N.Y. 10036.

LAWN WEED CONTROL, F261, Free. MSU Bulletin Office, P.O. Box 231, East Lansing, Michigan 48823.

LAWN WEED CONTROL WITH HERBICIDES, G 123, Free. Publications Div., Office of Information, USDA, Washington, D.C. 20250.

LAWN WEEDS AND THEIR CONTROL, 68, EC68-178, 30¢. Information Office, Extension Service, University of Nebraska, Lincoln, Nebraska 68503.

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LAWN WEEDS: IDENTIFICATION AND CONTROL, C873, Free. Publications Office, College of Agriculture, Urbana, Illinois 61801.

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NATIONAL AGRICULTURAL CHEMICALS ASSOCIATION. Fact Information sheet. Free. NACA, The Madison Building, 1155 Fifteenth St. N.W., Washington, D.C. 20005.

THE NATURE, ECOLOGY, AND CONTROL OF CANADA THISTLE, T 1386, 15¢. Superintendent of Documents, Govt. Printing Office, Washington, D.C. 20402.

NEW CHEMICAL FOR CONTROL OF BLUEBELL, BLACK MEDIC AND YARROW IN BLUEGRASS TURF, P-7S, 10¢. Bulletin Room, Colorado State Univ., Ft. Collins, Colo. 80521.

NEW ENGLAND CHEMICAL WEED CONTROL REVIEW FOR VEGETABLES FOR COMMERCIAL GROWERS ONLY, 70-64, Free. Agricultural Publications, College of Agriculture and Natural Resources, University of Connecticut, Storrs, Conn. 06268.

NODDING THISTLE CONTROL WITH 2,4-D, 227-A, Free. Cooperative Extension Service, College of Agriculture and Home Economics, Univ. of Kentucky, Lexington, Ky. 40506.

THE NORTHEASTERN WEED SCIENCE SOCIETY PROCEEDINGS—1971, $6.50. Arthur Bing, Sec.-Treas., Cornell Ornamentals Research Lab., Farmingdale, New York 11735.

NOXIOUS WEEDS OF INDIANA, BP-10-1, Free. Agricultural Information, Agricultural Adm. Bldg., Purdue University, Lafayette, Ind. 47907.

NOXIOUS WEED IN MARYLAND, EB-221, Free. Agricultural Publications Distribution, Agricultural Publications Annex, Univ. of Md., College Park, Md. 20742.

THE OUTLOOK FOR WEEDS, IN 1970, FS 1342, 2¢. Public Distribution Center, Printing and Publications Bldg., Iowa State Univ., Ames, Iowa 50010.

PARATHION MANUAL. 20¢. National Agricultural Chemicals Association, The Madison Building, 1155 Fifteenth St. N.W., Washington, D.C. 20005.

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PESTICIDE CONTAINER DISPOSAL. A Look at Burning. WTT article. Xerox copy 75¢.

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PESTICIDE STORAGE AND FORMULATION SHED, FS AgChem 4, 2¢. Bulletin Room, 3 Coffey Hall, Univ. of Minn., St. Paul, Minn. 55101.

PESTICIDES. Report of the Secretary's Commission on Pesticides and Their Relationship to Environmental Health. 677 pages. $4.00. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

PESTICIDES—A GUIDE TO SAFE USE, L-143, 15¢. Extension Office of Information, The Ohio State University, 2120 Fyffe Rd., Columbus, Ohio 43210.

PESTICIDES HANDBOOK—ENTOMA. 323 pages. Compiled by Dr. Donald E. H. Frear, in consultation with the Entomological Society of America and the National Pest Control Assoc., Paper Bound, $3.25, Cloth Bound, $4.75, College Science Publishers, State College, Pa. 16801.

POA ANNUA CONTROL by W. H. Daniel, Purdue University. WTT article. Xerox copy 75¢.

POA ANNUA CONTROL by Cecil F. Kerr, Turf products manager, Rhodia, Inc., Chipman Div., WTT article. Xerox copy 75¢.

POA ANNUA CONTROL at Whitemarsh Country Club, Philadelphia, Pa. by Phil Lance. WTT article. Xerox copy 75¢.

POISON IVY—How to Recognize It and Control It, A273, Free. Agri. Info. Dept., Univ. of N. Dak., Fargo, N. Dak. 58102.

POISON IVY, POISON OAK AND POISON, FB1972, Free. Information Office, Extension Service, University of Nebraska, Lincoln, Nebraska 68503.

POISON-IVY, POISON-OAK AND POISON SUMAC: IDENTIFICATION, PRECAUTIONS, ERADICATION, F 1972, Free. Publications Div., Office of Information, USDA, Washington, D.C. 20250.

POISON OAK AND ITS CONTROL, 40, Free. Agricultural Publications, 207 University Hall, Univ. of Calif., Berkeley, Calif. 94720.

PONDWEEDS AND PONDWEEDLIKE PLANTS OF EASTERN NORTH AMERICA, Circular 187, U.S.D.I., Fish & Wildlife Service, "C" St. Between 18th & 19th, Washington, D.C. 20204.

PREEMERGENCE LAWN WEED CONTROL TRIALS, NEBRASKA—1968, CC201, 10¢. Information Office, Extension Service, University of Nebraska, Lincoln, Nebraska 68503.

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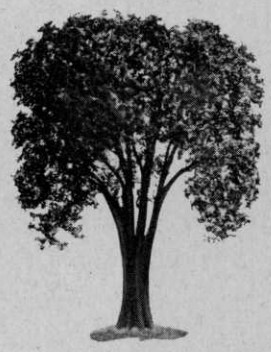

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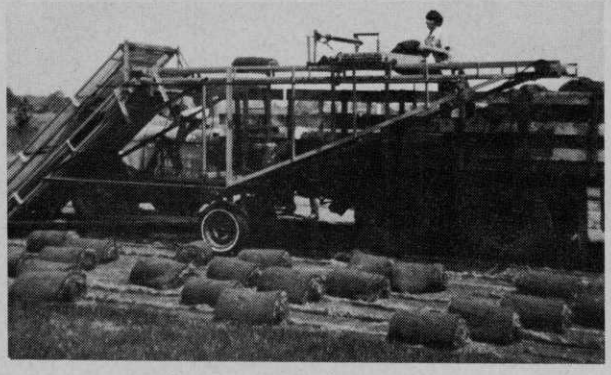

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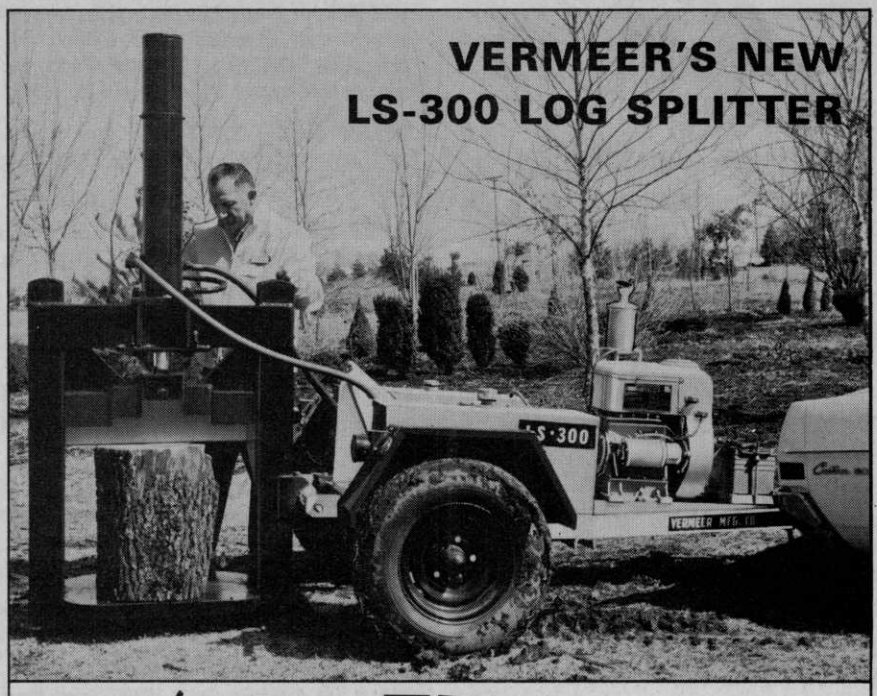

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From logs to firewood in seconds . . . that's a real job. And, that's the job Vermeer's LS-300 Log Splitter does . . . faster, safer and more economically than ever before. This compact unit splits any log up to 29" in height. A single control lever activates the powerful overhead cylinder, hydraulically wedging a heavy-duty cutting blade through the log under 30,000 lbs. of splitting force. Blade returns automatically to the starting position for next cycle. You can have a truckload of firewood cut, stacked and loaded for delivery in less than an hour. Write for complete literature and information. Yes, we demonstrate!

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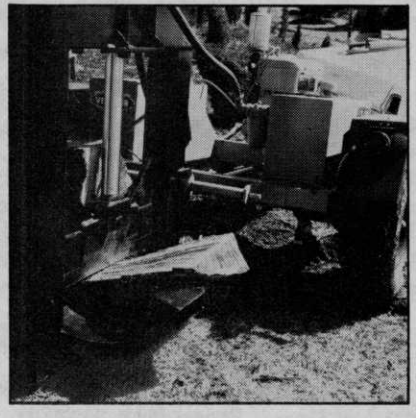

An ideal unit for parks, campgrounds, forestries and tree farms; great for supplying firewood to homeowners, hotels, institutions, winter resorts, lodges, clubs, etc. It's a real moneymaker for tree service firms, nurseries, and rental operators. The LS-300 is a portable, self-contained unit, powered by an 18 hp Wisconsin engine and may be pulled at normal highway speeds behind any towing vehicle.

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ers for mounting on tractor 3-point suspension. Free. The Broyhill Company, North Market Square, Dakota City, Neb. 68731.

SPRAY PUMP CATALOG. Free. Hypro, Inc., Div. Lear Siegler, Inc., 347 Fifth Ave. N.W., New Brighton, St. Paul, Minn. 55112.

SOIL PROCESSING EQUIPMENT catalog. 24 pages. Free. Lindig Mfg. Corp., 1875 West County Road C, St. Paul, Minn. 55113.

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TANDEX SOIL STERILANT product folder. Free. Niagara Chemical Div., FMC Corporation, 100 Niagara St., Middleport, N. Y. 14105.

TEEJET AGRICULTURAL SPRAY NOZZLES and accessories. Catalog 35. Free. Spraying Systems Co., 3201 Randolph St., Bellwood, Ill. 60104.

TEEJET SPRAY NOZZLES AND ACCESSORIES. Bulletin 151. Free. Spraying Systems Co. 3201 Randolph St., Bellwood, Ill. 60104.

TOTE HERBICIDE data sheet. Free C. B. Dolge Co., Westport, Conn 06880.

TREFLAN pre-emergence herbicide to control weeds and grasses in nursery stock or established ornamental shrubbery and flower beds. Data sheet. Free. Elanco Products Co., 740 S. Alabama St., P. O. Box 1968, Indianapolis, Ind. 46205.

TREX-SAN, a broad spectrum post emergent herbicide for broadleaf weed control. Data sheet. Free. Mallinckrodt Chemical Works, Second and Mallinckrodt Sts., St. Louis, Mo. 63160.

TRIGGER HANDLE GUNJET spray guns. Bulletin 140. Free. Spraying Systems Co. 3201 Randolph St., Bellwood, Ill. 60104.

TRIMEC HERBICIDE. Data sheet. Free. Gordon Corporation, 300 South Third St., Kansas City, Kan. 66118.

TRIONIC, Data Sheet, Free. Colloidal Products Corp. P. O. Box 621, Petaluma, Calif. 94952.

TURF CHEMICALS CATALOG. Free. Vesicol Chemical Corporation, 341 E. Ohio St., Chicago, Ill. 60611.

TURF PRODUCTS CATALOG, Mallinckrodt Chemical Works. 38-pages. Free. Mallinckrodt Chemical Works, Second and Mallinckrodt Sts., St. Louis, Mo. 63160.

VAPAM soil fumigant. No. A-1028. Free Stauffer Chemical Co., Agricultural Chemicals Div., 299 Park Ave., New York, N. Y. 10017.

VAPAM soil fumigant. No. A-10309. Free. Stauffer Chemical Co., Agricultural Chemicals Div., 299 Park Ave., New York, N. Y. 10017.

VISKO-RHAP Invert Spraying, Specification Sheet and Catalog, Free Rhodia Inc., Chipman Div., 120 Jersey Avenue, New Brunswick, New Jersey 08903.

WEED AND BRUSH CUTTERS. Specification sheets, Free. Rowco Mfg. Co., Inc., Dept. WT-370, 48 Emerald St., Keene, N. H. 03431.

WEED-FREE HERBICIDE, Data sheet, Free. Chapman Chemical Co., 416 E. Brooks Rd., P.O. Box 9158, Memphis, Tenn.

X/77, Spreader-Activator for Agricultural Sprays, Data Sheet, Free. Colloidal Products, P.O. Box 621, Petaluma, Calif. 94952.

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AQUATIC WEED CONTROL. jh, sh, c, a. 20 min. Free loan. Chevron Chemical Co., 200 Bush St., San Francisco, Calif. 94120.

CHEMICAL MOWING. Adult. 15-20 min. Free-loan. Uniroyal Chemical, Elm St., Naugatuck, Conn. 06770.

FACTS ABOUT PESTICIDES. sh-c-a. 13 min. Free-loan. Manufacturing Chemists Association, 1825 Connecticut Ave. N.W., Washington, D.C. 20009.

FILM GUIDE ON PESTICIDES, 10¢. National Agricultural Chemicals Association, The Madison Building, 1155 Fifteenth St. N.W., Washington, D.C. 20005.

FMC CHEMICALS. jh-sh-c-a. 25 min. Free-loan. FMC Corporation, Advertising and Public Relations Dept., 633 Third Ave., New York, N.Y. 10017.

HANDLE WITH CARE. For industry showing. 18 min. Free-loan. National Agricultural Chemicals Association, The Madison Building, 1155 Fifteenth St. N.W., Washington, D.C. 20005.

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PESTICIDES—FUNDAMENTALS of Proper Application. sh-c-a. 16 min. Free-loan. Sterling Movies, 43 West 61st., New York, N.Y. 10023.

PHYTAR 560. sh-c-a. 15 min. Free-loan. The Ansul Co., 1 Staunton St., Marinette, Wisconsin 54143.

QUACK GRASS—The Perennial Guest. sh-c-a. 16 min. Free-loan. The Dow Chemical Co. Film Librarian, 2030 Abbott Road Center, Midland, Michigan 48640.

ROOTS AND ALL. sh-c. 15 min. Free-loan. Modern Talking Picture Service, 1212 Ave. of the Americas, New York, N.Y. 10036.

SHOWDOWN AT NIAGARA. jh-sh-c-a. 13 min. Research and pesticide development. Niagara Chemical Division, FMC Corporation, 633 Third Ave., New York, N.Y. 10017.

STORY OF A LAKE. jh-sh-c-a. 12 min. Aquatic Weed control. Free-loan. Chevron Chemical Co., 200 Bush St., San Francisco, Calif. 94120.

industry people on the move

PROFESSIONAL LANDSCAPE CONTRACTORS ASSOCIATION OF OHIO has selected these officers for 1971: President — N. H. Strnad, Strnad Landscape Contractors, Cleveland; vice-president — H. Calhoun, Calhoun's Landscaping, Inc., South Euclid; secretary — D. Sharpe, D. Sharpe Landscaping, Berea; treasurer — R. Swinerton, R. Swinerton Landscaping, Eastlake; sergeant-at-arms — K. Burge, K. Burge Landscaping, Mayfield Heights; historian — N. Thomas Strnad, Strnad Landscape Contractors, Cleveland.

Directors are C. Impullitti of Impullitti & Sons Landscaping, Inc.; Highland Heights; V. Apanius of Better Lawns & Gardens, Inc., Richmond Heights; D. DiSanto of DiSanto Landscape Co., Lyndhurst; H. Kuznik of H. Kuznik & Associates, Independence; M. Morton of M. Morton Landscape Gardener, Bedford Heights; and A. Semirale of A. Semirale Nursery & Landscaping, Solon.

* * *

PHILLIP B. CHURCH is Union Carbide's newest technical sales representative for agricultural products and services, headquartered at Salinas, Calif.

* * *

JOHN F. FERGUSON has been named vice-president of production for the agricultural chemicals division of CIBA-GEIGY Corporation.

* * *

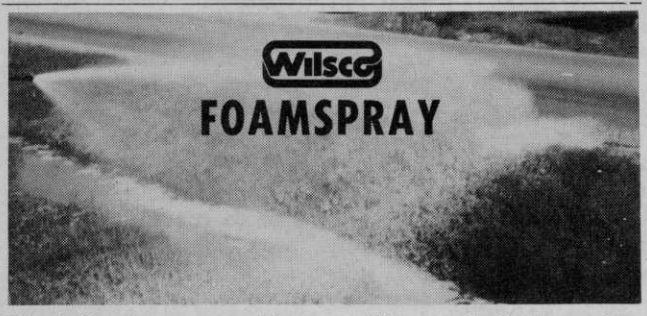
DAVID W. PICKETT of Woodbine is the new president of the Maryland Turfgrass Association, Inc. Other officers are: Vice-president — Paul Pearson of Gaithersburg; treasurer — Emory P. Patton of Silver Spring; executive secretary — Dr. Andrew J. Powell of the University of Maryland; New directors are Stephen M. Marfak of Gaithersburg and John E. Patton of Silver Spring. Re-elected directors are Gene Roberts of Glenn Dale and Robert Hawkins of Germantown. Outgoing president Edward Mayen of Olney remains on the board. Carry-over directors are Parker Shirling of Centreville and M. H. Day, University of Maryland.

* * *

ROBERT C. TYO has been elected president and chief executive officer of Leigh Products, Inc.

* * *

ROBERT C. MOREAU and **G. QUENTIN BROWN** are new regional sales managers for Velsicol Chemical Corporation. Moreau heads the Midwest Region; Brown, the Southwest Region.



Wilsco's foaming agent enables more efficient and effective application of herbicides. FoamSpray reduces the amount of water needed; increases the herbicide action on the plant surface; provides visual evidence of spray coverage. No special equipment needed other than foam generator attachment for spray nozzle.

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Bowls and screens are easy to remove and replace.

Choice of 40 mesh or 80 mesh screens.

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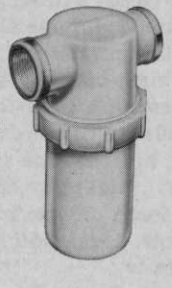
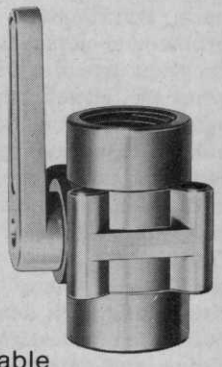


Plastic ball valves



Quick-turn shut-off valves of polyvinyl chloride can't rust, last for years. Other plastic and elastomer materials, including ABS, are also available. Double buna-N seals assure positive, leak-proof operation. Both straight shut-off and 3-way types are available.

Two body sizes — ½ and ¾ inch. ½ inch valves are available with ports threaded ½" NPT male or female, ¾" NPT male, with ⅝" hose barb or socket for ½" or ¾" plastic pipe.

¾" valves are available with ports threaded ¾" or 1" NPT female, or with sockets for ¾" or 1" plastic pipe.

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Over Southern Weed Science Progress . . .

LEGISLATIVE NOOSE QUIVERS

Among key persons making the Southern Weed Science Society Conference a success this year were, from the left, George Sistrunk of Valley Chemical Co., Greenville, Miss., master of ceremonies; Leonard Lett, southern manager of Colloidal Products Corp., Memphis, chairman of arrangements; and out-going president D. D. Boatright, head of Horne-Boatright Chemical Co., Birmingham.

Southern Weed Science Society's new officers are (from the left) Front row: P. W. Santelmann, secretary-treasurer, Oklahoma State University; T. J. Hernandez, president-elect, Du Pont; J. R. Orsinego, president, University of Florida; A. F. Wiese, vice-president, Texas A. & M. University; R. E. Talbert, secretary-treasurer-elect, University of Arkansas. Rear row: J. F. Miller, editor-elect, University of Georgia; W. M. Lewis, executive board, North Carolina State University; J. T. Gaspard, executive board, CIBA-Geigy; Jim Becton, executive board, CIBA-Geigy; and A. D. Worsham, editor, North Carolina State University.

Put 1,000 weed control specialists together for a week and the status of the industry in 1971 becomes quite clear. That's the crux of the recent 24th annual session of the Southern Weed Science Society at Memphis, Tenn. Delegates represented both commercial and educational areas of the industry. Both sales and research people expressed the common concern that the science of weed control is being damaged severely by restrictive legislation.

Few industry leaders in this session were willing to quarrel with the need for pesticide controls or legislation. Rather, their concern is that such controls will not be based on research plus the best available knowledge and experience in the field, but that the so-called "disaster logic" sweeping the nation today will force unwise moves on the part of both local and national governments.

D. D. Boatright, president of the Society and also president of the Horne-Boatright Chemical Company, Birmingham, Ala., placed the problem in perspective early on the program agenda when he outlined what he termed "the most discouraging aspect on the use of pesticides." This, Boatright stated, is the fact that an irresponsible charge or accusation may be made without cost, preparation, or even mental reflection. But it may take months and the time of many reputable scientists, along with untold thousands of dollars to investigate such alleged claims and determine the truth.

Boatright's belief is that every member of the industry will have to do more in careful testing and use of chemicals. "Although some products are being maligned," he said, "it is still the primary responsibility of basic producers to obtain complete knowledge about their chemicals, or their new products, even at the expense of increased costs and delayed marketings." Thus, he pointed out, we are forced to revise our approaches, to correct any past deficiencies, and assure ourselves that this must eventually be for the good of all concerned.

New findings always abound at this scientific oriented session. More than 140 papers were presented this year, all tied in some manner to the use of pesticides for control of unwanted vegetation. Homer A. Brady, researcher at the USDA Southern Forest Experiment Station, Pineville, La., related his latest studies with brush-control sprays. Because 2,4,5-T has been cited as an allegedly hazardous herbicide, Brady has stepped up efforts to test other formulations which will produce the same hardwood brush kill. He reported on 16 herbicidal sprays tested for this use.

Brady found that dicamba and picloram, alone or in mixture with 2,4,5-T were as effective as 2,4,5-T ester in killing hardwood brush. Of 15 formulations tested, at least one excelled 2,4,5-T on every species except dogwood. Many of the formulations damaged loblolly pine and thus are not suitable for release on pine in forest management. Ammonium nitrate as a spray additive did not, he reported, increase herbicidal effectiveness.

By way of summary, Brady said that though none of the herbicidal formulations gave the 75 percent overall topkill needed for brush control, all were as effective as the 2,4,5-T control. Therefore, he said, it is possible to reduce the amount 2,4,5-T used or to substitute one of the other herbicides, though this will prove to be a more expensive operation.

Wildlife specialist William F. Gusey, Shell Oil Company, made some interesting revelations concerning the U.S. wildlife resource. It is necessary to investigate only a few areas where desert, wasteland,

or other lands have been converted into productive farm land, he said, to determine that the variety and abundance of wildlife have increased manyfold.

Gusey related that Lewis and Clark recorded extreme hardship in finding wildlife for food during their trek from western Montana through Idaho, and down the Columbia River. Today, Gusey stated, in that same area, which has been logged heavily and is farmed extensively, deer and elk abound and can be harvested virtually without restriction.

And in Pennsylvania, a 15-year study of the ecological aspects of chemical brush control on a utility right-of-way showed a similar pattern. Gusey reported that wildlife usage of the treated right-of-way in Pennsylvania was much higher than the adjacent wooded areas which were seriously overbrowsed and nearly bare of low cover and food. Rabbits, grouse, and wild turkeys, he said, benefitted from the stable, low cover induced by the herbicidal treatments. Major game species in the area, he said, likewise heavily used the area.

Gusey related like survey results for birds and fish in a number of areas across the nation. He said that, "Rather than constituting a basis for more regulations, we hope that a better understanding of wildlife habits will permit broader use of a greater variety of chemicals than is allowed now."

Coming more into prominence in the overall weed control picture is the special treatments required for aquatic weed control. Dennis L. Vedder, Applied Biochemists, Inc., Milwaukee, Wis., discussed the use of Cutrine, an algicide, in flowing water. A special application technique is necessary, he said, because routine surface application does not permit proper contact time. To achieve the desired control in flowing water, his company has developed a drip system for application. In every test, the drip system application of Cutrine proved effective against algae. Since Cutrine is compatible with many aquatic herbicides, it has been mixed with herbicides and used to control both weeds and algae simultaneously, via the drip system. Cutrine and diquat have been tested together in Wisconsin for the past two years, Vedder reported. Few common aquatic species can survive this combination, he said.

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Versatile Myers spraying equipment controls weeds, insects and fungus to help you maintain high quality turf, shrubbery, grounds. There's a wide choice of Myers sprayers: Tractor mounted, skid and trailer models . . . PTO or engine powered . . . boom, gun and air blower application. Steel and GlasStran (fiberglass) tanks.

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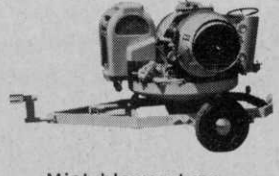

Mist blower type sprayer, one man operation.

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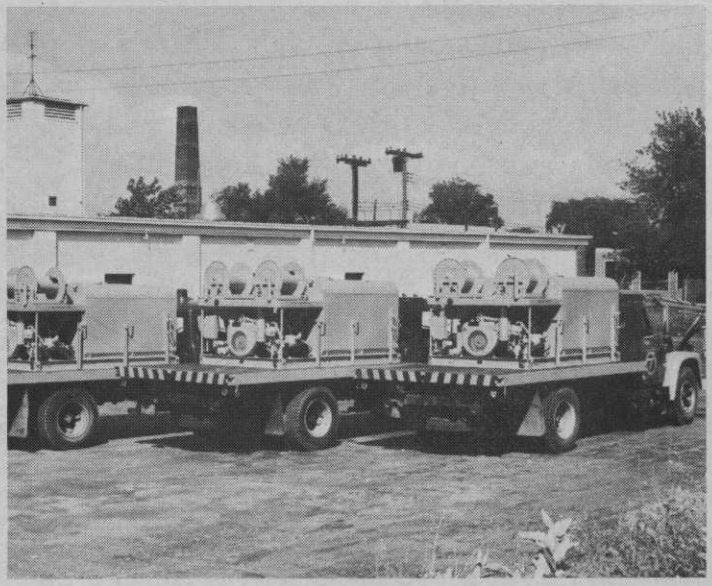
SPRAY PLANE, Piper Aircraft, Lock Haven, Pa.

The completely new PA-36 Pawnee II is an addition to Piper's line of agricultural models, the Pawnee 235 and 260. The prototype has been in flight test for more than a year and production tooling will make the plane available to customers in about 14 months. With a gross weight of 3,800 pounds under Part 23/FAA, the plane is larger by far than any other ag plane Piper has built. Pawnee II will be available in two versions — a 285 hp model with a 30 cu. ft. hopper and a 320 hp with a 37 cu. ft. hopper. Overall length is 27.7 ft. with a wing span of 39 ft. and wing area of 235 sq. ft. Fuel capacity will be 75 gal. in bladder-type cells with Firestone reticulated foam as an optional feature. Design features include a full cantilever wing with fiberglass tips and a leading edge that is easily detached for field inspection and maintenance. For more details, circle (701) on the reply card.

AQUATIC WEED HARVESTER, Clark Equipment Co., Cassopolis, Mich.

This self-propelled harvester cuts weeds and algae at depths to five feet and brings them aboard by conveyor belt. When a full load has been harvested, the unit moves to shore and deposits the weeds into a waiting truck through the use of an auger and an elevating conveyor. Two men handle the entire operation. The unit has a top speed of 7 mph and can harvest 2½ tons per hour. A sickle bar provides the cutting action. The unit is 35 ft. long, 8 ft. wide, and weighs 7,000 lbs. It can be transported over the highway by trailer. For more details, circle (702) on the reply card.

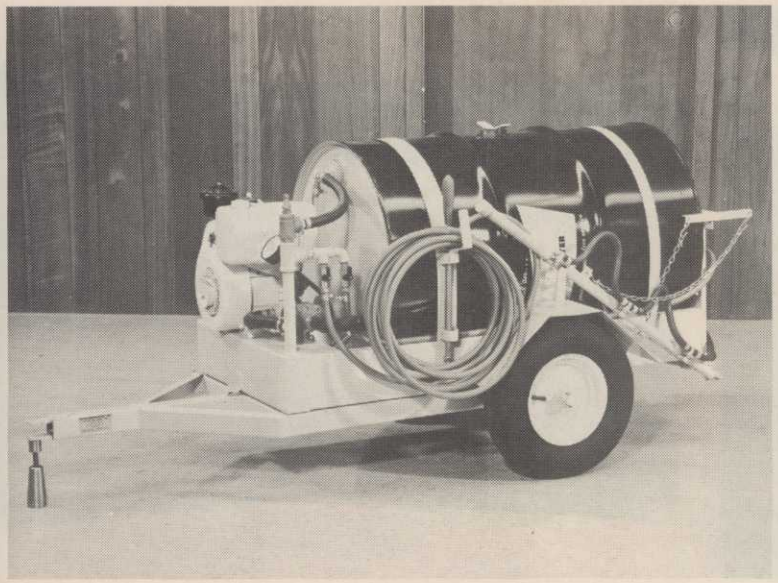


ROADSIDE SPRAYERS, Friend Manufacturing Corp., Gasport, N.Y.

Show above are three of six roadside sprayers delivered to the New York State Department of Transportation for weed and brush control along super-highway center malls and side shoulders. Twenty units are now operated by the New York transportation department. Featuring a 1,000-gal. tank and pump delivering up to 100 gpm at 200 psi, the spraying can be done either from spray guns with 200 feet of hose stored on hose reels or from a front-mounted boom. This boom is hydraulically operated and can be swung out to operate from either the right side or left side of the truck. For more details, circle (705) on the reply card.

SELF-PROPELLED MOWER, Deines Welding, Inc., Ransom, Kans.

Features of the Marty J Model 212 include hydrostatic drive transmission on both drive wheels, aircraft type controls with skid steering, 40-inch twin blade cut, floating mower deck, Turf Savor flotation tires, 12 hp Lauson gas engine with automotive type ignition and self-starting system and 10 amp alternator. Rugged all-steel construction, the Marty J travels from 0 to 6½ mph in either forward or reverse. For more details, circle (706) on the reply card.



MINI-POWER SPRAYER, Larson Machine, Inc., Princeville, Ill.

Larson's new Mini-Power spraying unit is the ideal answer to users who need mobility plus capacity. Skid-mounted, one-bolt removal, the unit is easy to load in the back of a station wagon or pick-up truck for on-site applications. Model UT-2356 features 55-gal. capacity drum, 3½ hp gas engine, Hypro pump, control gauge, 25 ft. of hose with adjustable hand gun. Unit is available with accessory equipment, including the UT-4 Utility Dump box, UT Spray Boom and controls and UT-7 Mini-Broadcaster Spreader. The sprayer is shown above mounted on the Model UT-2 utility trailer. For more information, circle (703) on the reply card.

AUTO-SPREADER TRAILER, Central Engineering Co., Milwaukee, Wis.

The Auto-Spreader-Trailer is a portable chemical and material spreader (complete with trailer) that holds one cubic yard of material. It has a completely self-contained 7 hp Briggs & Stratton engine. A system of hydraulic controls regulates both auger and spinner from either car or cab to provide positive control of amount and range of spread coverage. Instant on-off control enables spot spreading. For more details, circle (704) on the reply card.

HANDY SHAKER, Niagara Chemical Div., FMC Corp, Middleport, N.Y.

A convenient hand shaker for applying Tandex soil sterilant has been designed for localized areas. Spot treatments to control weeds, brambles, and woody plants can be made where mowers can't reach. Tandex is a urea-carbamate compound with broad spectrum control of weeds and grasses. For more details, circle (707) on the reply card.

PLASTIC SPRAYER, Universal Metal Products, Coopersville, Mich.

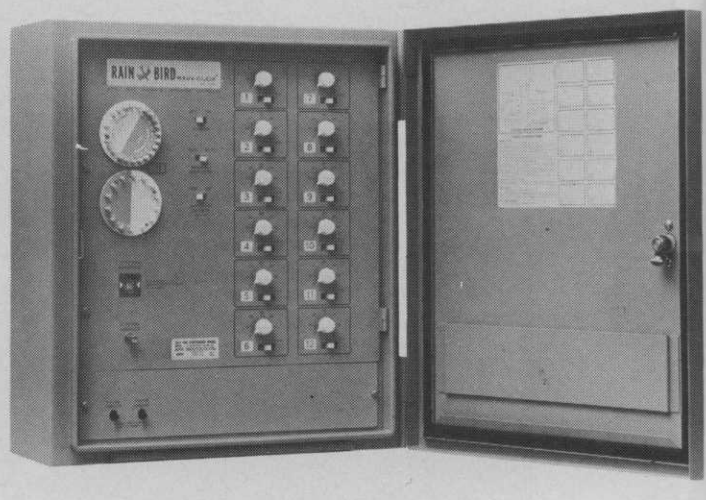
The "Featherweight" is lightweight, rust and corrosion proof sprayer made of high density durable polyethylene that resists most materials that can be sprayed. It has a 30" soft supple hose and a 12" angled solid brass wand. A "quick pressure" pump gives all the pressure needed for the 1¼-gal. tank capacity. For more details, circle (708) on the reply card.

BIG ANDY HOSE-END SPRAYER, The Leisure Group, Inc., Los Angeles, Calif.

Brass grommets have been added to the 1971 line of Big Andy hose-end spray guns to provide more precise control than plastic. Units are available for ridding turf, shrubs or trees of pests, or for fertilizing. Model A-21 and its glass jar companion Model A-20 has a 20-gal. capacity. For more details, circle (709) on the reply card.

HOVERPALLET, Holland Bulb Co., Portland, Ore.

The Hoverpallet is an exciting adaptation of the Hover principle. Basically, it's a machine that rides on a cushion of air. Built in England, the pallet is designed to traverse almost any terrain and is at its best on mud, snow, ice and soft ground where conventional equipment is inadequate. It will pass over delicate crops and ground without causing damage. Maintenance is low; it has all fibreglass construction, one moving part, the special fan, driven by an air-cooled Briggs & Stratton motor. It can carry a payload of up to 850 lbs., varying a little depending upon the ground surface. For more details, circle (710) on the reply card.



AUTOMATIC SPRINKLER CONTROLLERS, Rain Bird Sprinkler Mfg., Glendora, Calif.

Rain Bird's improved automatic sprinkler controllers are said to be the perfect water tenders for large turf installations. These completely transistorized solid state units operate 12, 18 or 23 irrigation stations and have the capability of repeating daily watering cycles. A 14-day clock provides automatic programming versatility; units may also be operated manually. Exclusive moisture sensor connection allows use with the Rain Bird "Irrometer." Available with either 26.5 or 30 volt output. Wall or pedestal mount. For more details, circle (711) on the reply card.

LOW-PROFILE TRACTOR UNIT, International Harvester Co., Chicago, Ill.

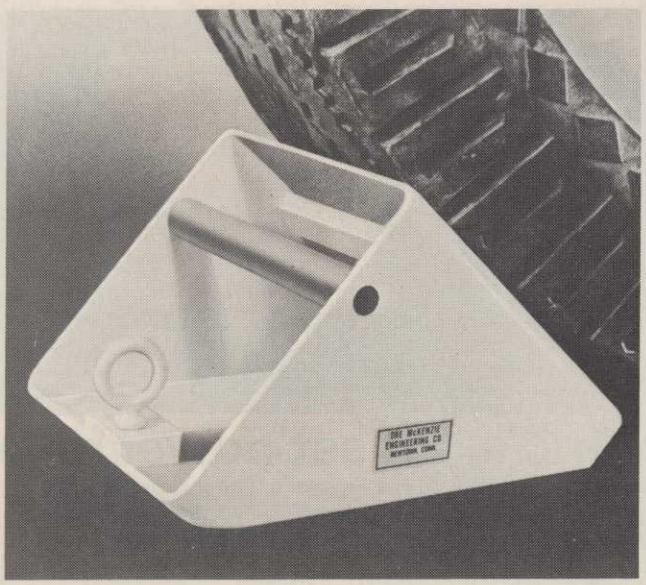
The low-profile International 2444 tractor is ideal for grounds maintenance and golf course landscaping operations. Pictured here equipped with 2050 loader and 72-inch wide material bucket and box scraper, the unit also comes with a three-point hitch and 84-inch wide International No. 70 industrial mower. For more details, circle (714) on the reply card.

LAWN VACUUM, Gilson Brothers Co., Plymouth, Wis.

Powered by Briggs & Stratton engines, the 1971 Gilson Lawn Vacuums are available in 3½ and 5 hp models. Leaves, grass, litter and other debris are packed into a large, reinforced canvas catch bag, supported by a rear swivel wheel with floating action for easier maneuverability. The vacuum rolls on semi-pneumatic tires and covers a 30-inch swath. Moving parts of the precision blower are completely housed for safety. For more details, circle (715) on the reply card.

HEAVY DUTY MOWER, Goodall Division, Louisville, Ky.

Goodall's heavy-duty 36-inch self-propelled mower propels itself, turns itself. Power steering levers at the operators fingertips allows you to engage or disengage either or both for quick turning. Extra large 13x5-inch puncture proof tires on steel traction wheels set in and behind cutting unit enables you to trim with both sides. Cutting unit has twin blades, heigh of cut adjustable from 1 to 4½ inches. Five forward ground speeds. Adjustable front guard, hinged chute, guard-leaf mulcher plate, brakes, six-quart fuel tank on handle, 8 hp Briggs & Stratton engine. for more details, circle (712) on the reply card.



WHEEL CHOCK, McKenzie Engineering Co., Newtown, Conn.

Unique, rugged, steel construction, non-slip wheel chock is ideal for any type truck in any weight class. Four-way steel tread plate bottom with steel cleats provides positive locking action even on steep grades. Bright, safety-yellow paint permits easy visibility. Fabricated from 3/16" steel plate. Available in two sizes, a "G 10 Heavy Duty Wheel Chock" for straight trucks and construction vehicles with up to 8.25x20 tire size, and "G 20 Heavy Duty Wheel Chock" for 12.00x24 maximum tire size. For more details, circle (713) on the reply card.

IRRIGATION COVERS, AMETEK/ Plymouth Plastics, Sheboygan, Wis.

Plastic control valve boxes, pits and covers are now available in a shade of green that blends with the turf. They're constructed of Superflexon, a tough, moisture and temperature resistant thermoplastic that will not shatter, rust or crumble. For more details, circle (716) on the reply card.

JOGGER, Chapin Co., Oak Park, Ill.

The Jogger is a new hand tool that tamps, almost with perpetual motion, asphalt and dirt, breaks concrete, drives stakes and forms pins. Saves time and money by replacing pneumatic tools on small construction jobs. For more details, circle (717) on the reply card.

LIFT TRUCK, Asplundh Chipper Co., Jenkintown, Pa.

The LA model is a non-over center device. Ground to bottom of basket heights are 40, 45, and 50 ft. Capacities in any position range from 925 lbs. on the LA-40 to 725 lbs. on the LA-50. All models are available with single or double, fixed or swivel baskets. For more details, circle (718) on the reply card.

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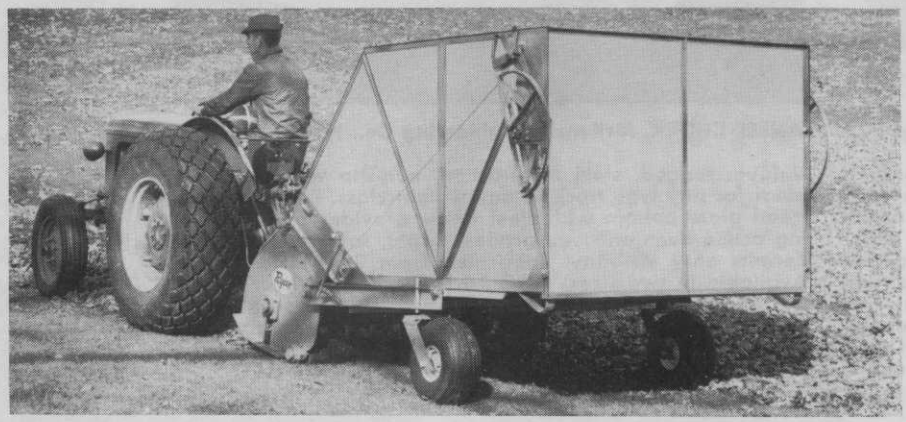
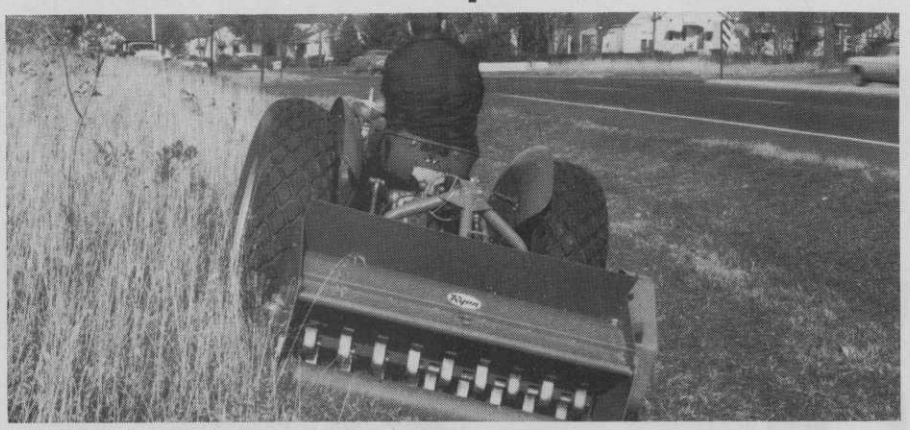


that also sweeps turf debris



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The tractor-drawn Grounds Groomer has vertical blades that slice and literally blow lifted thatch, leaves, twigs, pine needles and cones, and other debris into the big 5-cubic-yard hopper. Even picks up eucalyptus leaves.

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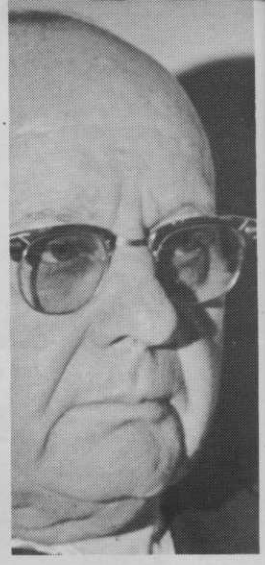

Key speakers at the 23rd California Weed Conference were, from the left, Dr. Emil Mrak, chancellor emeritus, University of California at Davis; Extension Specialist Bill Harvey of UC; and Dr. Julius Johnson of Dow Chemical Co., Midland, Mich..

California Weed Conference

A NATIONAL

RESTRICTIONS on the herbicide 2,4,5-T and how to avoid similar government "mistakes" occupied the 800 weed control specialists who attended the 23rd annual California Weed Conference in Sacramento.

The conference heard a proposal for a national laboratory to test and register pesticides, a call for greater professionalism among pesticide applicators, and advice on pesticide safety.

"There is no doubt whatsoever we are living in an era of chaos resulting from consumerism, lack of understanding and education, political expediency and the unfortunate, misinterpreted, misstated and misemphasized information through the public communications media," stated Dr. Emil Mrak, keynote speaker and chairman of the federal Pesticide Advisory Committee and formerly chairman of the federal Commission on Pesticides and Their Relationship to Environmental Health.

"Strange as it may seem, though we have the most abundant and diverse food supply in the world, we have in our nation the greatest number of food worriers the world has ever known, yet our longevity has gone up and there is no evidence of any harm (with two relatively minor exceptions) to the human organism caused by food toxicants," Dr. Mrak said. "On the other hand, there is a great deal of evidence that tobacco causes harm and we go along merrily permitting its sale and use."

Mrak said in his opinion the real need is for government to publish pesticide safety protocols which manufacturers and the public can understand and rely upon. Though his remarks dealt with food produc-

PESTICIDE LAB

tion, they held obvious relevance to all pesticide and herbicide users present because a panic decision to protect a food supply can have severe implications for all weed and pest control.

"To my knowledge there has been little if any work done to determine the relation between dosage of chemical additives or pesticides in foods to their effect on the organism," he said. "The customary procedure has been to feed extremely massive doses to animals, in some cases amounting to thousands of times, in fact, many thousands of times, that which might be ingested by humans in food on a weight per weight basis.

"Furthermore, the chemical might be force fed or injected as was done with 2,4,5-T rather than taken into the body in food as the human would ordinarily do. Ordinarily the chemical is fed in a pure state and not as it may occur in food.

"I believe, therefore, what is so direly needed in connection with the testing of foods and the establishment of standards for safety is the development of protocols to test for safety," Mrak said. "We do not have general outlines for procedures for testing for safety, and until they are developed I am afraid we will experience one crisis after another relating to the safety of our foods. Today, industry just does not know what is expected of it, how to proceed, where to go for information or what to do."

Developing suitable protocols is no simple job, though, Mrak said. He predicted years of testing with animals will be required.

For this job, he proposed establishment of a national laboratory, perhaps at the Army Biological Warfare Facility at Pine Bluffs, Ark., which is being closed by Presidential directive. "This is a real possibility if industry will help," he asserted. There might, as well, be a national center for reliable information established, under some prominent chairman and composed of scientists and others of impeccable reputation, to publish facts and dispel misinformation on questions such as pesticide poisonings, he said.

Dr. Julius E. Johnson, director of research for the Dow Chemical Co. and a member of the Mrak commission, supported the need for government protocols for pesticide testing, but he stressed industry should have a voice in how the protocols are drawn. Protocols should be flexible enough to allow individual judgment and they should include provisions for deliberate changes, he said.

Dr. Johnson also recommended government certification of industrial, commercial, university and government laboratories to standardize the adequacy of their personnel, procedures, equipment and facilities and to install public confidence in their findings. Then, he said only toxicological data from certified laboratories should be admitted in support of new chemical products. Second suppliers of pesticides, who enter the market after original patents expire, could be allowed then to purchase certified data, Dr. Johnson said, cutting the second supplier's "unfair competitive advantage over the company which has borne the original cost of development.

"Then it would be possible to lay the registration and the tolerance petitions open for inspection and to encourage publication," he said. "Openness of the data at this point would relieve many objections. Today neither the qualified investigator nor the public have access to the facts if they want them, hence the public is suspicious. Moreover the experiment stations, expected to help support the use of a product, do not have access to certain registration information. Experiment stations and extension specialists need confidence in the validity of the back-up information. Moreover, the public official charged with registration and tolerance proceedings is under pressure because the present policy forbids him from making certain information available without the consent of the petitioner. The whole situation promotes public distrust because the supporting facts are not out in the open."

Apologizing to competent pesticide applicators, Dr. Johnson said "one of

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the weakest links in the chain is in the diagnosis of pest problems and application of pesticides." These critical tasks often are done by unskilled, poorly paid and non-professional craftsmen, he said.

He suggested some pesticides should be classified for professional use only and restricted from use by anyone but a professionally licensed applicator. Training for such applicators would be provided in agricultural schools, he said.

"The grower would then pay for results and the whole process would be less poundage oriented and more result oriented," he said.

Extension Specialist Bill Harvey of the University of California at Davis offered still more information about herbicides and the environment, concluding "there is no real threat to the environment from the use of herbicides, other than the direct changes in vegetation which we expect from the applications we are making."

Harvey, who is known as "Mr. Weed" for his long association in the field and with the conference, said herbicides have relatively short persistence in the environment under most conditions, and few herbicides are toxic to man or animals.

Problems arise from drift, volatility, leaching and surface movement of herbicides, all of which are well known and usually can be guarded against, he said. "The one we have the most trouble with is drift," he said. "But remember, any herbicide in the environment is far more apt to be a hazard to other plant species than it is to any animal species."

"We need herbicides to change the environment so we can have more food, more fiber, a better place to live and be free of poison oak and some of these other annoying weeds," he concluded.

New officers of the California Weed Conference Executive Committee for 1971 are: President—Dell O. Clark, State Department of Agriculture, Sacramento; vice-president —Bryant Washburn, Washburn Agricultural Service, Davis; secretary—Howard Rhoads, California State Polytechnic College, San Luis Obispo; business manager-treasurer — Warren V. Johnson, State Department of Water Resources, Sacramento; directors — Dave Bayer, University of California, Davis, and Paul Houghton, Southern Pacific Transportation Co., Oakland.

classifieds

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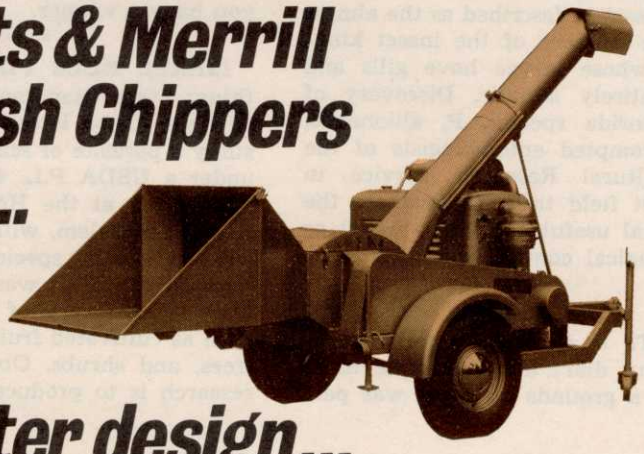

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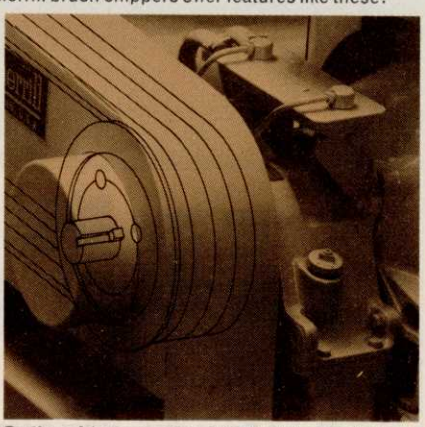

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trimmings

SOMETHING KEPT EATING the Eurasian watermilfoil that federal aquatic weed scientists at Gainesville, Fla., were trying to grow for laboratory observation. So destructive was the pest that they decided to switch attention from the plant to the pest. They learned that 25 larvae of the moth of the genus Parapoynx could destroy milfoil in a 15-gal. aquarium in three days. The insect is described as the almost unique member of the insect kingdom, whose larvae have gills and are entirely aquatic. Discovery of the Florida species, P. allionealis, has prompted entomologists of the Agricultural Research Service to conduct field trials to evaluate the practical usefulness of the insect as a biological control of milfoil.

* * *

WE WOULD LIKE TO GIVE CREDIT to the person for this report but don't know who he is. It seems a grounds manager was perplexed over why his stadium's new artificial turf was turning brown. Upon close inspection, he discovered it was being eaten by artificial chinch bugs.

* * *

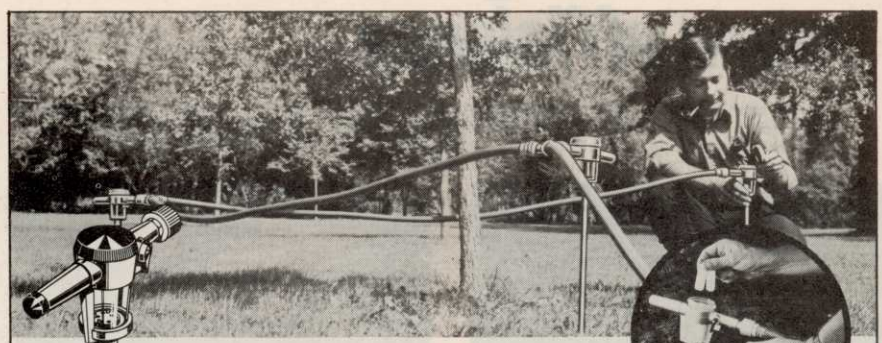
NO STICKY WICKET, said head groundsman Jim Fairbrother after a Toro Greensmaster had made its debut on Britain's foremost cricket field last season. Several national teams commented on the condition of Lords Cricket Ground. Highest acclaim came from South African cricket star Eddie Barlow. And when a South African player gives a compliment, Fairbrother said, you know you have a winner.

* * *

ISRAEL DOES FIND TIME for things other than matching swords with the Arabs. Israeli scientists will study a parasite of scale insect pests under a USDA P.L. 480 grant. Entomologists at the Hebrew University of Jerusalem, will collect, identify, and catalog species of the wasp, Microterys. The wasp parasitizes scale insects, pests of woody plants, such as cultivated fruits, ornamental trees, and shrubs. Objective of the research is to produce a taxonomic revision of Microterys occurring in Israel.

* * *

CERTAIN STONE AND QUARRY products have been added to the gypsy moth quarantine list. It means that ground or pulverized stone and quarry products must be inspected and certified to be free of moths or egg masses. Previous articles listed are trees and shrubs or their parts grown in a greenhouse; boughs or cuttings with stems no greater than a half-inch in diameter; parts of trees and shrubs that have been dried, pressed, waxed, laquered, varnished, or surface treated; processed or kiln-dried lumber; manufactured wood products; shavings, sawdust, wood flour, excelsior, and cedar bedding.



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